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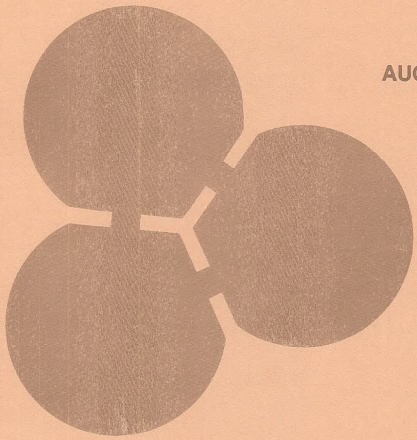

UINTAH BASIN SYNFUELS DEVELOPMENT

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Socio-Economic Technical Report for the Uintah Basin Synfuels Environmental Impact Statement

Submitted By

UTAH State Energy Office
Utah State Planning Coordinator's Office
Department of Community and Economic Development

July 26, 1982

ACKNOWLEDGMENT PAGE

The State Planning Coordinator's Office would like to thank and acknowledge the assistance of: the many companies for providing their respective work force estimates and the best available information on the projects; the Bureau of Economic and Business Research, University of Utah, for providing valuable technical assistance in making the projections; and the Uintah Basin Association of Governments, the Uintah County planner, and other local officials for providing critical information about current economic activities in the region and assistance in developing assumptions concerning of population impacts to communities.

The Department of Community and Economic Development would like to thank and acknowledge the assistance of: the Uintah Basin Association of Governments; the Uintah County Commission and planners; the officials of Vernal City and their planners; the officials of Roosevelt City and Duchesne County; the officials of Utah Indian Tribe and their staff; the Bureau of Indian Affairs at Ft. Duchesne; Don Peters of the U.S. Public Health Services; officials of the Uintah County and Duchesne County School Districts; the Uintah Basin Health Systems Agency; the officials of Duchesne County Hospital and Ashley Valley Hospital; the Uintah County and Duchesne County Sheriff's offices; the Rangely Police Departments; the Rangely School District; the Rangely Hospital; the Rangely Community Planner; and the Colorado Department of Local Affairs.

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INTRODUCTION

The Socio-Economic Technical Report for the Regional Synthetic Fuels Environmental Impact Statement provides the economic and demographic baseline and impact projections used for analyses of the other components of the study which requires such information. The study area includes both the oil shale and tar sands resource areas and the communities impacted by the development of those resources. Initially the study area was defined as the Uintah Basin Multi-county Planning District (MCD) which encompasses most of the area; it includes the Utah counties of Daggett, Duchesne, and Uintah. Grand County, part of the Southeast Association of Governments, is included as a potential impact area. A portion of the impact is also anticipated to affect Rio Blanco, Moffat and Mesa Counties in Colorado. A map of the study area is provided in Figure 1.

A criterion of significant impacts was applied to the projected population impacts; this resulted in a more narrowly defined geographic and political area for further analysis. The criterion used was that if the population impact generated an increase of ten percent or more to the baseline population, it was significant. This rule was applied to the county projections and the community projections to determine which of those would be analyzed. The final study area includes, in Utah, Duchesne and Uintah counties and the communities of Vernal, Roosevelt, Myton and Ballard. In Colorado, the impacts are not significant at the county level but are significant for the communities of Rangely and Dinosaur.

In the following discussion these two communities will be the area of focus for analyzing the impacts in Colorado. In cases where the analysis is made only at the county level and not at the community level, such as for personal income, Moffat and Rio Blanco Counties are included. It should be noted that the analysis of the impact on communities is limited to incorporated towns. The impacts of the unincorporated areas can be significant and should be taken into consideration in any decision-making process. However the lack of defined boundaries for unincorporated areas precludes them from the type of analysis undertaken in this report.

The year of peak construction employment and the year of full operations employment were selected as the points in time for detailed analyses of impacts.

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The report is organized in two volumes: Volume I includes the scenarios for the regional analysis; Volume II covers the analysis of the projects from a site-specific level.

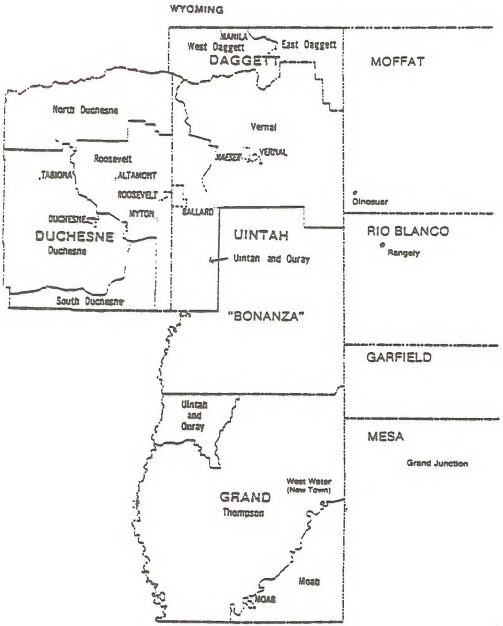
WYOMING
MANILA
West Daggett
East Daggett
DAGGETT
MOFFAT
North Duchesne
Vernal
Roosevelt
MAESER
VERNAL
TABIONA
ALTAMONT
ROOSEVELT
Dinosaur
MYTON
BALLARD
DUCHESNE
DUCHESNE
Duchesne
UINTAH
RIO BLANCO
Uintah and Ouray
Rangely
South Duchesne
"BONANZA"
GARFIELD
Uintah and Ouray
MESA
Grand Junction
GRAND
Thompson
West Water (New Town)
Moab
MOAB

FIGURE 1

METHODOLOGY

The employment and population projections were generated by using Utah's economic and demographic impact projection model, UPED79. The UPED79 model produces projections based on labor market regions. In this study, two regions were used: the Uintah Basin MCD, with an adjustment to reflect the potential impact area in Colorado, and the Southeastern MCD, which contains Grand County. These regional projections were disaggregated to the census county divisions (CCD's) using a spatial allocation model (SAM) developed by the Bureau of Economic and Business Research at the University of Utah. The models project population, migration, and labor force by age and sex; households by age and sex of head; school age population by education level and sex; and employment. Both baseline and impact projections of population are provided at the community level.

The impact on personal income resulting from the construction and operation of the synthetic fuel projects and interrelated projects in the study area is based on changes in numbers of people in the impact area; changes in the number and industrial mix of jobs in the area; changes in per capita property incomes, transfer payments, and personal contributions to social insurance; and changes in wage rates in each industrial sector. It is beyond the scope of this study to address the general problem of projecting rates of inflation. A more detailed discussion of the methodologies are provided in Appendix M of this report.

The State of Utah, Department of Community and Economic Development has developed guidelines of services for a variety of community infrastructures. These service guidelines were developed in coordination with other state agencies through the Socio-Economic Impact Mitigation Task Force. These guidelines provided the basis for the projection of service demand, although modification of some of the guidelines were made to more accurately reflect the unique characteristics of the study area.

Housing:

The demand for housing was forecast from the UPED model.

Education:

The forecast of additional students is an output of the UPED model (see description of UPED in the methodology). Classroom and teachers were determined based on a service guideline of 25 pupils per teacher and classroom.

Medical:

Hospital bed need was forecast on a service delivery guideline of 2 beds per 1,000 population. Emergency medical services were projected from a guideline of 1 ambulance per 5,000 population and 7 EMT's per ambulance. Health manpower was forecast from the following standards:

- 1 physician per 1,800 population
- 1 dentist per 2,000 population
- 1 nurse per 600 population
- 1 public health nurse per 5,000 population

Mental Health:

A service guideline was forecast on 1 social worker per 5,000 population and 1 clinical psychologist/psychiatrist per 20,000 population.

Law Enforcement:

The need for law enforcement services were determined through a standard of 2 police officers per 1,000 population. Patrol cars were forecast on a standard of 3 officers per 1 patrol car.

Libraries:

The demand for library books were determined on a need for 2 books per person. Library space was determined based on a service guideline of .5 square feet per person.

Parks:

The need for neighborhood park acreage was determined from a service guideline of 6 acres per 1,000 population.

Sewer:

The need for sewer services was determined from a standard of 100 waste flow gallons per person per day.

Water:

The demand for water was forecast from the following service guidelines:

- 3.4 persons per connection
- 800 GPCD (gallons per connection per day) for water rights
- 1,600 GPCD for water supply
- 800 GPCD for water storage
- 1,600 GPCD for source production

CHAPTER R1

REGIONAL OVERVIEW

The baseline projections reflect the future based on the existing economic structure of the areas and the changing demographic characteristics of the population. The baseline is not a prediction of the future but rather an attempt to depict the direction current trends are likely to take in the area without synthetic fuel developments. Alternative projections which include synthetic fuel developments are compared to the baseline projection to determine their impacts. A characteristic of the baseline projections is a declining rate of growth over time. It is assumed that with a given economic structure, an area will begin to stablize over the years as its economy matures. Under this condition, accelerated growth would require increases in the basic employment sectors that would change the area's economic structure. The Utah Process Economic and Demographic Impact Projection Model (UPED) was applied in making both the baseline projections and the impact projections for this analysis.*

The impacts in Grand County are not analyzed in detail since the assumption is that the significant impacts would be mitigated by development of a new town. However, for purposes of reference, the projections for Grand County are provided in Appendix L, and Grand County will be included in the discussion of baseline projections and the population and employment impacts.

The baseline projection for the study area shows the population increasing by over 5 percent annually until 1985 and by nearly 4 percent annually until 1990 after which it becomes relatively stable. The source of this growth is primarily a result of the increases in oil and gas exploration and extraction, the construction and operation of one unit of the Bonanza power plant and mining of the required coal for the plant, and the Central Utah Project development units.

*UPED79, Report on Revisions of the Utah Process Economic and Demographic Impact Model, Bureau of Economic and Business Research, University of Utah and Utah State Planning Coordinator's Office, Salt Lake City, Utah, January, 1980.

The employment in oil and gas is included in the broad sector, mining. Growth in the mining sector is projected at an annual rate of 7.4 percent through 1985; this growth is projected to slow to 3.6 percent annually until 1990 after which it becomes stable. These projected levels of activity are consistent with what is anticipated by the oil exploration companies operating in the area.

The relative significance of this growth is reflected in Table R1A-1 which compares employment by sector in terms of percentage of total employment. Mining as a component of total employment increases from 18 percent to 22 percent between 1980 and 1990. Other sectors which increased in relative importance were transportation, communication and utilities, and government. Sectors which declined in terms of relative importance were agriculture, trades, and services. The structure of the economy by the year 2000 does not change significantly from that of 1990.

The growth in non-basic employment sectors of the economy of the area does indicate that more goods and services will be produced for its own consumption. The implicit employment multiplier increases from 1.7 in 1980 to just over 1.8 by the year 2000.

TABLE R1A-1

Study Area
Employment by Sector
as a Percent of Total

INDUSTRY	1980	1990	2000
Agriculture	8%	5%	4%
Mining	18	22	22
Contract Construction	4	4	4
Manufacturing	3.5	3	3
Transp., Comm. & Utilities	5	7	7
Wholesale & Retail Trade	17.5	16	16
Finance, Insurance, Real Estate	2	2	2
Services	13	12	12
Government	18	20	19
Non-farm Proprietors	10	10	12
Total*	100	100	100

*May not add to 100% because of rounding of figures.

CHAPTER R2

AFFECTED ENVIRONMENT

POPULATION CHARACTERISTICS BASED ON THE 1980 CENSUS*

The following discussion is a brief description of the potential impact area based on 1980 census data. In 1980 Duchesne County had a population of 12,565. Of these people, 2.5 percent were minorities, with Indians accounting for (91 percent). The ratio of males to females indicated that 50.8 percent of the total population was male. Roosevelt County Census Division (CCD) was the largest division with Roosevelt the largest city (30.5 percent of total population). Duchesne City had the next largest population with 13.3 percent of the county total, then Myton with 4 percent, Altamont with 2 percent and Tabiona with 1.2 percent. Of the total population, preschoolers accounted for 14.5 percent, school age accounted for 49.8 percent, work force age 28.6 percent, and over 65 years old accounted for 6.9 percent. The Duchesne County population was generally younger than the state's population with a median age of 24.2 years compared to 22 years.

In 1980 20,506 people lived in Unitah County; 9.7 percent were minorities, with Indians accounting for (98 percent). Vernal CCD is the largest division with Vernal as the largest city (32 percent of the total population). Ballard was the next largest city with only 2.7 percent of the total population. There were slightly more males than females (.1 percent) with the predominant age group being 35-44 years old, (10 percent). Preschoolers made up 14.7 percent, school age made up 26.7 percent, work force age made up 52.6 percent, and over 65 years old made up 6 percent. The median age was higher in Uintah County at 22.9 years but still represented a younger population than the state.

Grand County had 8,241 people in 1980 with equal numbers of males and females. The largest division was Moab, with Moab City as the largest city. Moab City had 65 percent of the population while the part of Green River extending into Grand County had only 1 percent. Indians accounted for 82 percent of the 2.4 percent of the total population who were minorities.

* See Appendixes A-F for the 1980 census data for the counties.

Preschoolers accounted for 12 percent of the population, while school age children accounted for 23 percent, work force age accounted for 58 percent while the population over 65 years old accounted for 7 percent. The largest group was the 35-44 year olds who accounted for 10.6 percent of the total population.

The Artesia CCD of Moffat County, Colorado had only 410 people living within its boundaries. Of these 52.4 percent were males to 47.6 were percent females. There were 9.5 percent of the population under 5, 25 percent of the population between 5 and 17, while the majority was between 18 and 64 years old (58.7 percent). 6.8 percent were over the age of 65.

The Rangely CCD of Rio Blanco County, Colorado was 53.5 percent male and 46.5 percent female. It had a population of 2,613 with 67.2 percent of its population between 18 and 64 years old. Preschoolers accounted for 8.7 percent, school-age children accounted for 20.5 percent and those over 65 years-of-age made up only 3.6 percent.

In all counties the largest percentage of the working-aged population fell between the ages of 35-44. Indians made up the single largest minority group but accounted for a small proportion of the total population. The over 65-age group was also small.

BASELINE PROJECTIONS

Employment & Economic Base

The employment projections are consistent with the patterns of employment historically. In Appendix G a historical series of non-agricultural wage and salary employment is provided. Duchesne and Uintah County projections are provided in Tables R2A-1 and R2A-2. (Detailed age characteristics for selected years are provided in Appendix J.) The unemployment rates have historically fluctuated in Duchesne, Uintah and Grand counties. (See Appendix G) Since 1978 the unemployment rate in Duchesne County has remained below the state's average rate (between 4-5 percent range); the same is true in Uintah County. The lower than state average rate can be traced to the increase in oil and gas exploration activities in those areas. In Grand County the rates were also low during the late 1970's; however, with a decline in uranium mining the current unemployment rate in Grand County is much higher than the state average, 12 percent as compared to 6.7 percent during February, 1982. Under conditions of an expanding economy in Duchesne and Uintah Counties, an anticipated unemployment rate will remain at the relatively low levels of 4 to 5 percent. This is true for both baseline projections and for projections assuming development of the synthetic fuels. In Grand County the unemployment rates will remain
relatively high in the baseline projection. With the development of synthetic fuels projects which impact Grand County, the unemployment rates would be expected to fall to the 5 percent levels. Preliminary data for Moffat and Rio Blanco counties is provided in Appendix H.

Daggett County is part of the Uintah Basin Multi-County Planning District and is included as part of the broad study area. However, because the impact on Daggett County is negligible, information about the County is not discussed here but rather is limited to data on current conditions and baseline projections and is listed in Appendix A.

TABLE R2A-1

DUCHESNE COUNTY
Baseline Projections

YEARS	POPULATION	BASIC EMPLOYMENT	TOTAL EMPLOYMENT[2]	HOUSEHOLDS	SCHOOL AGE POP. (5-17)
1980	12,565	2,876	4,893	3,773	3,515
1981	14,623	3,551	4,910	4,431	4,020
1982	15,273	3,615	6,124	4,642	4,137
1983	16,014	3,725	6,390	4,867	4,269
1984	17,338	4,038	6,946	5,270	4,544
1985	17,778	4,176	7,203	5,323	4,764
1986	18,098	4,141	7,246	5,386	4,771
1987	18,173	4,018	7,269	5,390	4,917
1988	18,620	4,051	7,295	5,460	5,166
1989	18,677	3,949	7,233	5,429	5,312
1990	18,632	3,836	7,132	5,377	5,430
1991	18,629	3,747	7,055	5,353	5,542
1992	18,697	3,733	7,055	5,357	5,650
1993	18,712	3,734	7,057	5,362	5,717
1994	18,726	3,748	7,068	5,366	5,756
1995	18,684	3,763	7,070	5,369	5,747
1996	18,625	3,782	7,071	5,367	5,707
1997	18,535	3,803	7,071	5,372	5,640
1998	18,456	3,825	7,074	5,381	5,552
1999	18,372	3,847	7,080	5,388	5,445
2000	18,292	3,871	7,085	5,396	5,325

[1]Projections from UPED and SAM models, Utah State Planning Coordinator Office and Bureau of Economic and Business Research, University of Utah, 1982.

[2]Total employment is the sum of basic and residentiary.

TABLE R2A-2

UINTAH COUNTY
Baseline Projections

YEARS	POPULATION	BASIC EMPLOYMENT	TOTAL EMPLOYMENT[2]	HOUSEHOLDS	SCHOOL AGE POP. (5-17)
1980	20,522	5,168	8,483	6,162	5,476
1981	22,771	5,844	9,556	6,900	6,034
1982	24,170	6,196	10,216	7,347	6,405
1983	25,436	6,525	10,816	7,731	6,740
1984	27,074	6,961	11,608	8,229	7,175
1985	25,730	6,036	10,585	7,706	6,818
1986	26,500	6,124	10,822	7,887	6,985
1987	27,307	6,228	11,079	8,055	7,361
1988	28,002	6,312	11,304	8,211	7,716
1989	28,698	6,400	11,529	8,342	8,080
1990	29,326	6,496	11,736	8,476	8,433
1991	29,741	6,509	11,827	8,546	8,848
1992	29,940	6,522	11,876	8,579	9,048
1993	29,982	6,536	11,895	8,591	9,160
1994	29,967	6,551	11,898	8,587	9,212
1995	29,863	6,567	11,886	8,581	9,186
1996	29,721	6,587	11,870	8,565	9,107
1997	29,529	6,609	11,848	8,559	8,986
1998	29,351	6,631	11,835	8,557	8,829
1999	29,167	6,655	11,820	8,553	8,645
2000	28,985	6,679	11,807	8,550	8,438

[1]Projections from UPED and SAM models, Utah State Planning Coordinator Office and Bureau of Economic and Business Research, University of Utah, 1982.

[2]Total employment is the sum of basic and residentiary.

In Duchesne County basic employment is projected to increase rapidly during the first half of the 1980's; the annual average growth rate will be over 7 percent. The growth of employment in oil and gas exploration and extraction accounts for the source of this change. Over the twenty-year projection period total employment is projected to increase annually by 1.9 percent. The primary employment sectors in Duchesne County will be mining, government, and wholesale and retail trade. By 1990, mining represents nearly 25 percent of total employment. (See Table R2A-3)

In Uintah County the construction of the Bonanza Power Plant will create a small peaking of employment in 1984 and will contribute to the increase in basic employment as it moves into the operations phase. Basic employment is projected to increase by nearly 8 percent annually through 1984, with the primary increase in construction employment; however, for the entire projection period the average annual rate will be 1.3 percent. Total employment is projected to grow at an annual rate of 1.7 percent. The primary employment sectors will be mining, government, trade and services. (See Table R2A-4)

In Grand County there will be no significant changes in the economy. Uranium mining has been the source of historical growth periods for this county. This industry also has experienced periods of decline; the price of processed uranium ore fell from $42.00 per pound in 1978 to about $27.00 per pound in 1981. (See Appendix L) The result of a stagnant mining sector is reflected in the shift in relative importance from mining to trade by 1990.

The projections have been allocated to the census county divisions with the Spatial Allocation Model (SAM). The result of the disaggregation is provided in Appendix K. In allocating the baseline projections described above, among the constituent CCD's, a number of crucial assumptions were made. The most important of these is that the proportional distribution among these CCD's of each sector's basic employment would retain the pattern observed in the 1978 calibration year. Also assumed was continuation of current inter-CCD trade patterns. Vernal CCD is assumed to continue serving as the highest order market center for most industrial sectors, with the other CCDs purchasing substantial amounts of goods and services from Vernal. The Roosevelt CCD also serves as a high order center, especially as a source of commodities for the Duchesne and Uintah-Ouray CCDs, but Roosevelt does continue to procure substantial quantities of goods and services from Vernal.

Table R2A-3

Baseline Employment Projections By Sector
Duchesne County - 1984 to 2000

Sectors	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Agriculture	518	506	495	485	475	465	455	447	439	430	422	415	382
Mining	1,360	1,419	1,480	1,540	1,600	1,660	1,719	1,719	1,719	1,719	1,719	1,719	1,719
Construction	237	245	249	251	256	258	258	260	262	262	263	263	265
Manufacturing	136	137	139	140	142	142	142	142	142	142	142	142	139
Transp. Commun. & Utilities	210	215	217	218	221	222	222	223	223	223	223	223	222
Wholesale & Retail Trade	1,137	1,163	1,179	1,185	1,204	1,209	1,209	1,209	1,211	1,210	1,208	1,205	1,184
Finance, Insurance, & Real Estate	126	131	133	135	138	139	140	141	142	142	143	143	143
Services	446	463	474	481	494	499	501	505	508	510	512	513	518
Government	1,273	1,325	1,362	1,392	1,437	1,462	1,474	1,483	1,490	1,491	1,488	1,479	1,428
Non-Farm Proprietors	758	781	796	809	826	839	851	869	888	906	926	945	1,064
Central Utah Project	745	816	720	533	502	337	159	58	32	20	20	20	20
Bonanza Power Plant	0	0	0	0	0	0	0	0	0	0	0	0	0

Table R2A-4

Baseline Employment Projections By Sector
Uintah County - 1984 to 2000

Sectors	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Agriculture	434	424	416	406	398	390	381	375	368	361	354	347	319
Mining	2,350	2,441	2,532	2,622	2,713	2,803	2,893	2,893	2,893	2,892	2,892	2,892	2,892
Construction	367	362	370	379	386	393	400	406	409	410	412	412	411
Manufacturing	397	396	398	399	400	401	402	403	403	403	404	404	401
Transp. Comun. & Utilities	565	560	566	572	577	582	586	589	591	592	592	592	588
Wholesale & Retail Trade	1,775	1,734	1,762	1,789	1,814	1,838	1,858	1,873	1,879	1,879	1,876	1,871	1,835
Finance, Insurance & Real Estate	177	174	179	183	187	191	195	197	199	200	201	201	200
Services	1,737	1,727	1,753	1,776	1,801	1,824	1,842	1,858	1,866	1,870	1,871	1,869	1,856
Government	1,773	1,758	1,826	1,900	1,966	2,033	2,084	2,117	2,131	2,132	2,123	2,106	2,082
Non-Farm Proprietors	862	863	885	905	924	945	964	986	1,006	1,025	1,044	1,062	1,174
Central Utah Project	43	21	13	22	10	3	3	3	3	3	3	3	3
Bonanza Power Plant	1,125	125	125	125	125	125	125	125	125	125	125	125	125

The Rangely Census County Division in Rio Blanco County will be impacted by the Bonanza Power Plant because the area will be the source for the required coal. As a result population is projected to increase significantly through 1985. The annual average population growth rate between 1980 and 2000 is projected to be nearly 3 percent. Total employment is projected to grow at an average annual rate o 2.9 percent. The Artesia CCD which contains Dinosaur also will be impacted by construction and operation of the Bonanza Power Plant. The population was projected to increase by about 50 percent by the peak of construction activity.

Population

Duchesne County population is projected to increase by 45 percent between 1980 and 2000; that is an increase from 12,600 to 18,300. (Population projections are compared by county for Utah in Figure 2.) The average annual growth rates for all counties is provided in Table R2A-5. The greatest portion of this growth is projected between 1980 to 1985. After 1985 there will be a substantial slowing of the growth rate and by 1995 the population size will stabilize.

The population in Uintah County is projected to increase by 41 percent between 1980 and 2000. The constuction of the Bonanza Power Plant will create an increase in population that will peak in the construction phase.

The baseline projection for the Grand County areas indicates population growing by about 3.6 percent per year from 1980 to 1985. However, after 1985, its growth will slow to an annual rate of about 1.4 percent (1985-1990) and then will begin to decline.

The community level projections were developed with the cooperation of representatives of the local governments. The basic assumption is that the proportion of the population which was historically located in incorporated communities would continue. The constraint to the growth is based on current capacities and existing plans for expansion of services and facilities. The community baseline projections of population and households are summarized for Utah communities in Table R2A-6. Summaries for Colorado communities are listed in Table R2A-7. The projection for Vernal indicates an annual growth rate of 2.6 percent from 1980 to 2000. The result of this growth will be an increase of over 4,000 people by the year 2000. Ballard's rate of growth will

be similar to Vernal; however, the result will be an increase of less that 400 people, resulting in a total population of just over 900 by the year 2000. The growth rates in Roosevelt and Myton are the same; 2 percent annually. Roosevelt's population increase over 20 years would be near 2,000 people, while the increase in Myton would be about 250. The population for Rangely is projected to increase at an annual rate of 3 percent resulting in an additional 1,800 people over 20 years. Dinosaur's annual growth rate will be much lower at 1.7 percent; the resultant population would be just over 400 by the year 2000 or an increase of 125 people. As noted earlier in the introduction, this report is limited to thediscussion of incorporated towns and cities and does not address the problems of the unincorporated communities.

COUNTY POPULATION PROJECTIONS

DUCHESNE, GRAND AND UINTAH COUNTIES

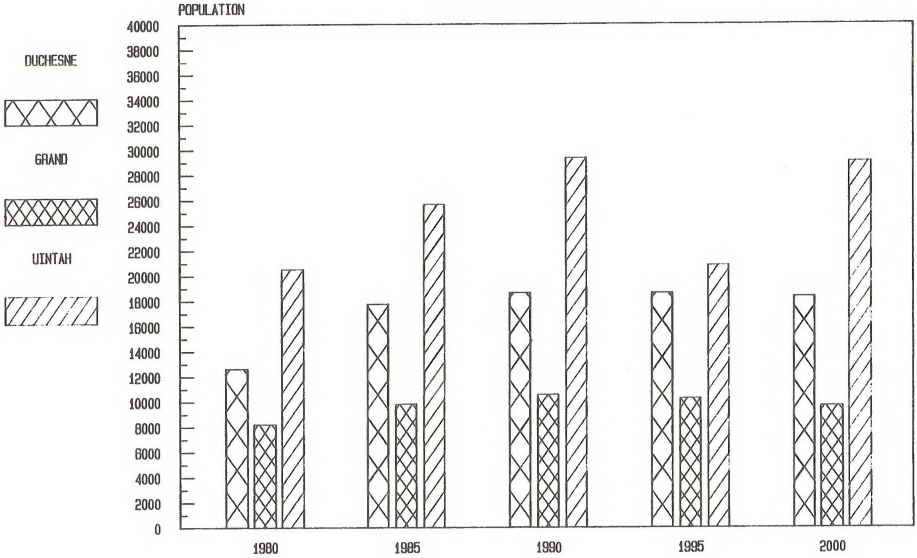

FIGURE 2

TABLE R2A-5

COUNTY BASELINE POPULATION GROWTH RATES
(Annual Average Rate)

County	1980-85	1985-90	1990-95	1995-2000
UTAH				
Duchesne	7.2	1.0	0.1	-0.4
Grand	3.6	1.4	-0.5	-1.3
Uintah	4.6	2.7	-0.36	-0.6
COLORADO[1]				
Moffat	2.9	2.7	0.1	0.1
Rio Blanco	5.1	3.2	-0.6	0

[1]Preliminary; not official until approval by Colorado Impact Task Force

TABLE R2A-6

UTAH
POPULATION BY COMMUNITY
Baseline Projections

	---Vernal----		---Roosevelt--		---Ballard---		---Myton---	
Year	Pop	Hshlds	Pop	Hshlds	Pop	Hshlds	Pop	Hshlds
1980	6,600	2,196	3,842	1,133	558	148	500	143
1981	7,786	2,622	4,453	1,349	640	171	580	168
1982	8,549	2,888	4,678	1,418	678	182	609	177
1983	9,240	3,122	4,911	1,493	712	191	639	185
1984	10,148	3,428	5,300	1,611	749	201	690	200
1985	9,291	3,087	5,416	1,622	775	205	705	201
1986	9,671	3,192	5,610	1,670	816	215	730	207
1987	10,074	3,325	5,759	1,709	857	224	750	212
1988	10,415	3,393	5,959	1,748	894	232	776	217
1989	10,757	3,470	5,997	1,743	932	240	781	216
1990	11,065	3,546	5,955	1,716	966	246	775	213
1991	11,286	3,617	5,933	1,710	980	249	773	213
1992	11,395	3,652	5,948	1,714	986	251	775	213
1993	11,421	3,660	5,948	1,714	985	251	775	213
1994	11,418	3,636	5,950	1,714	982	249	775	213
1995	11,369	3,620	5,934	1,709	976	248	773	212
1996	11,300	3,620	5,912	1,704	968	247	770	212
1997	11,206	3,603	5,879	1,704	957	245	776	212
1998	11,119	3,598	5,850	1,704	947	244	762	212
1999	11,030	3,592	5,819	1,704	936	243	758	212
2000	10,941	3,587	5,789	1,704	926	242	754	212

Pop = Population
Hshlds = Households

TABLE R2A-7

COLORADO
POPULATION BY COMMUNITY
BASELINE PROJECTIONS*

Year	RANGELY		DINOSAUR	
	Population	Households	Population	Households
1980	2,126	743	312	110
1981	2,323	812	356	125
1982	3,235	1,131	451	158
1983	3,519	1,230	475	167
1984	3,055	1,068	423	148
1985	3,193	1,116	501	176
1986	3,277	1,146	440	154
1987	3,337	1,126	435	153
1988	3,577	1,251	396	139
1989	3,703	1,295	394	138
1990	3,993	1,396	405	142
1991	4,030	1,409	413	145
1992	3,885	1,358	416	146
1993	3,725	1,303	420	147
1994	3,766	1,317	423	149
1995	3,805	1,330	425	149
1996	3,337	1,167	429	151
1997	3,870	1,353	433	152
1998	3,902	1,364	435	153
1999	3,935	1,376	436	153
2000	3,962	1,385	437	153

* These projections are preliminary; the household estimates are based on a constant average household size from the 1980 Census.

Wages and Income

The analysis of income and wages was carried out at the county levels, and the data is provided in 1980 dollars. It is beyond the scope of this study to address the general problem of projecting rates of inflation.

The average monthly wages for the Duchesne and Uintah Counties from 1975 to 1980 for each major non-agricultural employment sector are provided in Table R2A-8. Mining, construction, transportation, communications, and utilities have had the highest average wage levels. Under the proposed developments, increased employment will be concentrated in these same sectors. The 1980 high average monthly wage for mining in Duchesne and Uintah Counties is $1,834 and $1,754 respectively; this contrasts to the low average monthly wage of $787 in Duchesne in the services sector and $883 in the trade sector in Uintah County. In Grand County average monthly wage is highest in construction at $1,702 per month and is the lowest in services sector at $662 per month. (See Appendix L.)

Per capita income has increased in all the counties in the study area since 1970. In Utah the average state per capita income increased by 17 percent between 1970 and 1979, and in Colorado the state per capita increase during that period is 26 percent. The county per capita income increases were subtantially higher than the states' averages. Duchesne, Grand and Uintah Counties increased by 52 percent, 45 percent and 42 percent, respectively from 1970 to 1979. The Colorado counties of Moffat and Rio Blanco increased by 55 percent and 35 percent, respectively. Tables R2A-9 and R2A-10 provide total personal income as well as per capita income. The Grand County data are presented in Appendix L.

TABLE R2A-8

DUCHESNE COUNTY
Average Monthly Non-Agricultural Wages By Sector
1975-1980

	1975	1976	1977	1978	1979	1980
Mining	1,781	*	1,936	2,084	2,010	1,834
Construction	1,197	1,027	1,413	1,614	1,610	1,570
Manufacturing	898	858	842	871	1,362	1,365
Transportation, Communications and Utilities	1,343	1,400	1,336	1,307	1,772	1,615
Trade	699	678	698	582	733	708
Finance, Insurance and Real Estate	840	*	855	831	880	875
Services	787	804	773	773	753	787
Government	950	941	913	927	921	809

* Not shown to avoid disclosure of individual firm data.

Source: Utah Department of Employment Security

TABLE R2A-9

TOTAL AND PER CAPITA PERSONAL INCOME BY COUNTY
UTAH 1970-1979
(in 1980 dollars)

	Duchesne		Uintah	
Year	Personal Income (thousands of dollars)	Per Capita Personal Income	Personal Income (thousands of dollars)	Per Capita Personal Income
1970	16,561	4,713	31,247	5,141
1971	18,872	4,483	33,868	4,850
1972	28,095	5,547	43,200	5,537
1973	39,418	6,593	51,282	5,879
1974	42,842	6,150	69,458	6,795
1975	46,36	6,126	76,444	6,694
1976	49,875	6,425	83,021	6,814
1977	55,604	6,581	93,842	6,863
1978	65,667	7,095	115,471	7,617
1979	75,326	7,161	133,937	7,307

Sources: Bureau of Economic Analysis, U.S. Department of Commerce, Bureau of the Census.

TABLE R2A-10

TOTAL AND PER CAPITA PERSONAL INCOME BY COUNTY
COLORADO 1970-1979
(in 1980 dollars)

	Moffat		Rio Blanco	
Year	Personal Income (thousands of dollars)	Per Capita Personal Income	Personal Income (thousands of dollars)	Per Capita Personal Income
1970	42,787	6,483	35,804	7,307
1971	49,921	7,680	37,482	7,809
1972	57,766	9,026	42,258	8,991
1973	62,009	9,119	45,523	9,105
1974	58,902	8,130	38,506	7,425
1975	67,820	8,224	36,744	6,864
1976	82,704	8,356	40,669	8,018
1977	97,824	9,372	42,109	8,242
1978	129,080	11,712	56,947	10,202
1979	124,921	10,094	61,740	9,861

Sources: Bureau of Economic Analysis, U.S. Department of Commerce, Bureau of the Census.

During the decade of the 1970's, county per capita personal income increased relative to the State of Utah's per capita personal income in Duchesne, Grand and Uintah Counties. In Colorado the relationship between state per capital personal income and Moffat and Rio Blanco per capita personal income has shown greater fluctuations during that period; however, both counties were within 98 and 96 percent of the state average by 1979. (See Tables R2A-11 and R2A-12; see Appendix L for Grand County) For Utah this relationship was utilized in projecting baseline county personal income figures.* Income projections at the county level have not yet been released.

Grand County per capita personal income is presumed to stabilize at 100 percent of the state figures for the entire projection period. This represents a slight decrease for Grand; the current difficulties of the uranium industry in Grand County make such a change reasonable. Per capita income in Duchesne and Uintah Counties have risen relative to the state average through the 1970's. This trend will continue with Duchesne County per capita personal income reaching 92 percent of the state figure and Uintah County reaching 95 percent by 1985 and throughout the projection period. Per capita personal income for Duchesne County is projected to increase at 2.3 percent annually from 1979 to 1985, and at 1.7 percent annually thereafter to the year 2000. Uintah County per capita income is projected to increase 2.5 percent annually from 1979 to 1985, and at 1.7 percent from 1985 to 2000. The county total personal income is derived by multiplying the per capita income projections by the baseline population projections for each year. The results are shown in Table R2A-13.

The per capita income projections for Moffat and Rio Blanco counties were developed by another method used by the Department of Local Affairs, State of Colorado. These projections reflect an increase from 1979 to 1985 of 1.3 percent annually for Moffat County; from 1985 to 2000 the annual growth rate is projected at 0.1 percent. For Rio Blanco County a large increase of 9 percent annually is projected from 1979 to 1985. Between 1985 to 2000 per capita income is projected to focus around $16,000. These projections are provided in Table R2A-14.

*The approach for projection of county personal income is developed by the Bureau of Economic and Business Research, University of Utah, Salt Lake City, Utah.

TABLE R2A-11

PER CAPITA PERSONAL INCOME (PCPI) AND COUNTY PCPI RELATIVE TO THE STATE.
UTAH 1970-1979
(in 1980 dollars)

Year	PCPI Utah	-----DUCHESNE------- PCPI	Ratio County/State	-----UINTAH----- PCPI	Ratio County/State
1970	6,781	4,713	.695	5,141	.758
1971	6,935	4,483	.646	4,850	.699
1972	7,290	5,547	.761	5,537	.760
1973	7,492	6,593	.880	5,879	.785
1974	7,377	6,150	.834	6,795	.921
1975	7,333	6,126	.835	6,694	.913
1976	7,621	6,425	.843	6,814	.894
1977	7,839	6,581	.840	6,863	.876
1978	8,028	7,095	.884	7,617	.949
1979	7,933	7,161	.903	7,307	.921

Sources: B.E.A.
U.S. Department of Commerce, Bureau of the Census

TABLE R2A-12

PER CAPITA PERSONAL INCOME (PCPI) AND COUNTY PCPI RELATIVE TO THE STATE.
COLORADO 1970-1979

Year	PCPI Colorado	--------MOFFAT---------- PCPI	Ratio County/State	-------RIO BLANCO--------- PCPI	Ratio County/State
1970	8,117	6,483	.7987	7,307	.8997
1971	8,473	7,680	.9064	7,809	.9216
1972	9,011	9,026	1.0017	8,991	.9978
1973	9,452	9,119	.9648	9,105	.9633
1974	9,120	8,130	.8914	7,425	.8141
1975	9,125	8,224	.9013	6,864	.7522
1976	9,374	8,356	.8914	8,018	.8553
1977	9,720	9,372	.9642	8,242	.8479
1978	10,155	11,712	1.1533	10,202	1.0046
1979	10,249	10,094	.9849	9,861	.9621

Sources: Bureau of Economic Analysis, U.S. Department of Commerce, Bureau of the Census.

TABLE R2A-13

BASELINE PERSONAL INCOME PROJECTIONS
UTAH
(in 1980 dollars: total in thousand of dollars)

Year	Utah Per Capita Income	Duchesne Per Capita	Duchesne Total Personal	Uintah Per Capita	Uintah Total Personal
1985	8,932	8,217	146,082	8,485	218,319
1986	9,087	8,360	151,299	8,633	228,775
1987	9,245	8,505	154,561	8,783	239,837
1988	9,406	8,654	161,138	8,936	250,226
1989	9,570	8,804	164,432	9,092	260,922
1990	9,736	8,957	166,887	9,249	271,236
1991	9,905	9,113	169,766	9,410	279,863
1992	10,078	9,272	173,359	9,574	286,646
1993	10,253	9,433	176,510	9,740	292,025
1994	10,431	9,597	179,713	9,910	296,973
1995	10,613	9,764	182,431	10,082	301,079
1996	10,797	9,933	185,002	10,257	304,848
1997	10,985	10,106	187,315	10,436	308,165
1998	11,176	10,282	189,765	10,617	311,620
1999	11,370	10,460	192,171	10,812	315,354
2000	11,568	10,643	194,682	10,990	318,545

Source: Developed from historical per capita personal income from the Bureau of Economic Analysis, U.S. Department of Commerce, Bureau of the Census
For projections of population, the UPED model is used.

TABLE R2A-14

BASELINE PERSONAL INCOME PROJECTIONS
Colorado Counties
(in 1980 dollars; Total in Thousand of Dollars)

	Rio Blanco		Moffat	
	Per Capita	Total Personal	Per Capita	Total Personal
1985	16,637	132,444	10,917	143,556
1986	16,570	136,338	10,957	145,262
1987	16,595	138,332	10,933	146,474
1988	16,251	144,974	10,942	148,364
1989	16,242	148,565	10,964	150,159
1990	15,996	154,295	11,006	152,078
1991	15,964	155,137	11,028	153,832
1992	15,658	150,983	11,013	154,793
1993	15,461	148,335	11,043	156,289
1994	15,460	149,663	11,059	157,757
1995	15,485	150,704	11,056	158,946
1996	15,554	151,487	11,048	160,047
1997	15,604	152,288	11,042	161,158
1998	15,682	153,074	11,051	162,447
1999	15,731	153,946	11,067	163,829
2000	15,793	154,831	11,083	165,213

SECTION R2B

INFRASTRUCTURE

Housing

Among the most basic elements indicative of community's level of living is the nature and condition of its housing. Housing is also one of the most immediately impacted areas during large-scale construction projects. The housing mix for the study area is comprised of 62 percent single-family homes, 25 percent mobile homes, 4 percent multi-family, with the remaining 9 percent being hotel/motel accommodations. Table R2B-1 delineates the housing mix by community. Mobile home use has declined steadily since the mid-1970's.

Motels provide an additional source of temporary housing during rapid growth. Uintah provides the largest share of motel units in the study area. These units have a large seasonal influx of tourists visiting the recreation areas. Based on the Uintah Basin Association of Government housing survey completed in August, 1981, 92 percent of the housing within Uintah and Duchesne Counties is standard or in new condition. Standard condition is defined as a house which appears to be in good repair; it has a roof and structural members and foundation, all of which are sound. New condition housing units are less than 10 years old. Table R2B-2 delineates the current housing conditions by community.

Uintah County has had the most rapid growth, approximately 40 percent increase from 1976 through 1981. The remaining counties have also received significant growth during the past six years. This trend is predicted to continue, particularly in Duchesne County. The growth in housing demand in Unitah County has led to a significantly higher average housing cost. A new 1,200 square foot home in Uintah County averages $68,000 compared to $60,000 for a similar home in Duchesne County. The relatively higher cost of housing within Uintah County has not significantly affected the vacancy rate, which is currently 3 percent. Housing demand in Duchesne County is also limited.

High demand for housing, particularly rental and single-family dwellings, has spawned a number of proposals for new housing tracts by developers.

TABLE R2B-I

Existing Dwelling Units Mix by Community

	Conventional	Mobile	Multi-Family	Hotel
Uintah County Total (1)	4,893	1,261	253	574
Ballard	112	49	0	0
Vernal	1,572	348	235	454
Unincorporated Areas	3,209	867	18	200
Duchesne County Total (1)	2,622	1,116	142	249
Altamont	35	44	4	0
Duchesne	290	257	30	97
Myton	105	64	0	0
Roosevelt	826	236	108	150
Tabiona	47	13	0	0
Unincorporated Areas	1,319	502	0	0
Rangely/Dinosaur (2)	365	138	119	N/A

1 Uintah Basin Housing Study, 8/81, Hutman, R., UBAG

2 John Pagini - Community Development Specialist, Rangely City Hall

TABLE R2B-2

Existing Housing Conditions by Community

	New	Standard	Deficient	Substandard
Uintah County Total	2,293	2,258	340	4
Ballard	67	37	8	0
Vernal	409	969	190	4
Unincorporated	1,817	1,252	142	0
Duchesne County Total	924	1,461	237	0
Altamont	10	17	8	0
Duchesne	128	150	12	0
Myton	20	56	29	0
Roosevelt	294	466	66	0
Tabiona	6	38	3	0
Unincorporated Area	466	734	199	0
Rangely*	0	308	0	57

*John Pagini; Community Planner, Rangely

Source: Uintah Basin Housing Study; R. Heitman; 8/81

Education

Actual 1980 enrollment and school capacity data for the study area is delineated in Table R2B-3. Uintah School District currently exceeds its capacity for enrollment by 3.2 percent. Duchesne School District has a 10.2 excess capacity. The Rangely School Distric is currently at 52 percent of capacity. Dinosaur has one school at 31 percent of capacity, with the remainder of its students attending Rangely schools.

Excess enrollment in the Uintah School District should be partially alleviated by the planned construction of two new elementary schools. An additional 40 percent increase in classrooms and a 30 percent increase in teachers would be required under baseline growth by 1985. (See Table R3.) Growth in the Duchesne School District could similarly require 12 percent more classrooms and 10 percent more teachers within the same time period. Baseline growth in the Rangely School District would require 230 teachers.

A shortage of classroom will continue under baseline growth (see Education in Chapter R3b-18), particularly at the junior high school level; however, the Uintah County School District has acquired 85 acreas of land for future school construction and use. The school district is also currently free of bonded indebtedness.

Duchesne School District owns 60 acres of undeveloped land in Roosevelt for future school expansion. Other signficant growth impacts on the education systems throughout the study area that should be considered. School buses are a major capital expenditure, and the State Board of Education suggests replacing them every ten years as a safety requirement. At the current time a large share of the school buses within the study area have exceeded the state guidelines for replacement. Additionally, federal guidelines for "educational services to the handicapped and special student" mandates a much smaller teacher/student ratio of 12 students per teacher rather than the 25-1 state standards. Special education services are required for 12-15 percent of the average school population.

Medical

The health care network in the study area is comprised of many complex interrelated segments. The Uintah Basin is served by two hospitals: one in Vernal and one in Roosevelt. Rangely is served by one hospital. These hospitals provide acute care services --

TABLE R2B-3

Current Enrollment and Capacity of Schools by District

Area	1981 Enrollment	Capacity	1981 % of Capacity
Uintah District Total	5257	5095	103.2
Todd Elementary	605	525	115.2
West Jr. High	270	250	108.0
Ashley Elementary	506	500	101.2
Central Elementary	381	400	95.3
Discovery Elementary	613	650	94.3
Maeser Elementary	597	500	119.4
Naples Elementary	513	575	89.2
Vernal Jr. High	883	775	113.9
Uintah High	815	800	101.9
Learning Center	74	120	61.7
Duchesne District Total	3823	4215	90.7
Altamont Elementary	368	320	115.0
Altamont High	225	280	80.4
Tabiona Elementary	88	80	110.0
Tabiona High	68	50	136.0
Duchesne Elementary	393	490	80.2
Duchesne High	307	350	87.7
Myton Elementary	204	350	58.3
Conamore Training	35	20	175.0
Roosevelt Elementary	269	300	89.7
East Elementary	615	500	102.5
Roosevelt Jr. High	456	475	96.0
Union High	580	600	96.7

	1981 Enrollment	Capacity	1981 % of Capacity
Rangely			
Parkview Elementary	211	400	52.8
Rangely Middle School	148	200	74.0
Rangely High School	152	500	30.4
Dinosaur Elementary (1-6)	86	275	31.3

Source: School District Officials

i.e. daily and short-stay services. Generally, these services can by classified as medical/surgical, pediatric, obstetrical/gynecological, and intensive care or coronary care. Acute care services are delivered at three levels of care:

- primary
- secondary
- tertiary

Primary care facilities provide basic services such as obstetrics, pediatrics, and general medical/surgical care. Secondary care is the next level of services, comprised basically of orthopedics, surgery, urology, and internal medicine. Tertiary care refers to the same services, at a more specialized level of care, such as neonatal units, open-heart surgery, cardiac catheterization, etc. Most secondary care is provided along the Wasatch Front in Utah, as well as all tertiary care.

The hospital at Vernal is a primary care hospital, owned by the private for profit Hospital Corporation of America. HCA purchased the Ashley Valley Hospital from Uintah County, the builder and original hospital administrator, in June, 1981. The Ashley Valley Hospital service area is primarily eastern Uintah and Dagget County, from which 85 percent of their patients are drawn. The Ashley Valley Hospital is comprised of 36 beds in the following categories:

medical/surgical	20
obstetrics/gynecological	10
ICU/CCU	4
pediatrics	2
	36

Duchesne County owns and administers the Duchesne County Hospital at Roosevelt, which is comprised of 32 beds as follows:

medical/surgical	19
obstetrics/gynecological	10
ICU/CCU	2
pediatrics	6*
	32

* Duchesne County Hospital utilizes the 6 pediatric beds for a recovery room.

The Duchesne County Hospital draws 85 percent of their patients from the general service area of Duchesne County, western and southern Uintah County. Duchesne County provides care for 60 percent of the residents in their service area. The remaining population receives care primarilyfrom the Wasatch Front. The utilization rate at Duchesne County Hospital (63.8 percent, 1980) falls within the acceptable range as designated by the Utah Health Systems Agency, although poor floor layout and structural deficiencies has limited the utilization of the hospital. A $4,736,000 bond for covering both the renovation and a 10-bed expansion was passed in June, 1981. The bond authorizes a $250,000 replacement clinic for Duchesne. Upon completion of this work, these facilities will more than adequately meet current service needs. Bed need under baseline conditions could grow in Duchesne County to 37 beds by 1995.

Dinosaur and Rangely are served by a hospital at Rangely. The 28-bed facility is comprised of the following:

medical/surgical	24
obstetrics/gynecological	4
	28

Rangely Hospital (the acute care facility servicing Colorado communities in the study area) has a current utilization rate of 25 percent*. Long-term nursing home care is available in Roosevelt. A critical shortage of capacity exists throughout the study area. The 51-bed Roosevelt facility, known as the Stewart Convalescent Home, has maintained a waiting list continuously during the last 5 years. Utilization has been 100 percent for over a decade. In fact, a 22-bed nursing home at Vernal was full until its closure in the late 1970's. Services provided at the facility are both by skilled nursing care and intermediate nursing care. No intermediate mental health care or alternative home care is available within the study area. Although the proposed synthetic fuel projects are not expected to significantly increase the number of elderly demanding long-term care, the shortage of service is expected to worsen even under baseline growth.

Health manpower within the study area already faces shortages, particularly among nurses and physicians (shown on Table R2B-4). The current number of dentists, 16, is adequate.

Source: Sarah Hogan - Rangely Hospital

TABLE R2B-4

Existing Health Manpower

	Nurses	Physicans	Dentists	EMT's	Ambulances
Duchesne County	32	8	8	51	3
Uintah County	36	8	8	35	3
Rangely/Dinosaur	10	3	1	11	2

TABLE R2B-5

Uintah Basin Existing Mental Health Facilities & Caseload

	Staff	Case Load				
		1976	1977	1978	1979	1980
Social Workers	2	938	793	1020	1521	1552
Psychologist/Psychiatrist	.3					
Total	2.3					

Source: Impact of Oil Shale Development on the Health Care Delivery System in the Uintah Basin, John Short & Associates, 11/81

Emergency medical services are available throughout the impact area, although the adequacy and accessability is not consistent.

Mental Health

Mental health services are those services that aid the mentally ill or emotionally disabled to meet personal and societal needs. Services generally fall into the following categories:

- o prevention
- o emergency or crisis intervention
- o treatment
- o diagnosis, and
- o rehabilitation

Services are provided from acute care hospitals to outpatient clinics. The counties of Uintah and Duchesne are served by the District VI Social Services Office in Vernal. The community of Rangely receives mental health services at Grand Junction. The District VI Social Services Office has only 2.3 full-time staff. The State has declared the region a primary shortage area and has proposed construction of a comprehensive mental health center for which funding is currently unavailable. The shortage of staff and facilities allows only crisis intervention, and even then, there is a waiting list. Table R2B-5 delineates existing facilities, case load, and staff.

Law Enforcement

Police services are provided by a network of law enforcement agencies within the study area, including Highway Patrol, county sheriffs, and local police departments. Within the Ute Reservation 11 tribal officers supply the policing needs. Federal and state managers supplement the law enforcement personnel in the recreation areas.

Table R2B-6 delineates the current county law enforcement facilities and staff. Jail capacity is available at each county seat; however, the expansion and upgrading of jail space at Uintah County in Vernal is cited by local law enforcement officials as the single most critical need. In addition, the Duchesne County jail space in Roosevelt is deficient because, according to local law enforcement officials, it is only suitable as a short term (12 hours) holding area.

Current police services in the county, local, and Highway Patrol appear adequate, although the recession has reduced resources available to the local law enforcement agencies. Table R2B-7 delineates the current make-up of law enforcement staff and facilities within the cities that maintain their own police departments.

TABLE R2B-8

Public Safety

Jails, Sheriff, City Police, Utah Highway Patrol

	Number City Police Stations	Number City Police Staff	No.City Police Support Staff	No.City Police Patrol Cars	Number Hwy. Patrol Officers	Number Hwy. Patrol Staff*	Number Hwy.Pat. Support Staff*	Number Hwy. Patrol Cars*	City Jails	Capacity City Jails	Staff City Jail
Duchesne County											
Roosevelt	1	11	5	8					1	3	.5
Uintah County					1	11	7	4			
Vernal	1	17	3	17							
Rangely	1	4	1	3	2	NA	NA	2	1	1	0

Ute Tribe, 11 officers

*Highway Patrol serves the entire Uintah Basin

Source: City Police Departments and Highway Patrol Office

Public Libraries

Roosevelt City library serves a county population of 13,050 in a 440 square foot facility. The seating capacity is adequate for eight patrons. The collection holds 250 books. The library in Duchesne is already inadequate to service quidelines of the State of Utah.

Uintah County also has a substantial shortage of libaray services. The Uintah County library is in Vernal, serving 20,506 people. The total floor space in the Library is 5,808 square feet, with a seating capacity of 120. The total number of books in this library is 25,209.

Rangely has a small part-time library. There is a Bookmobile service in the Uintah Basin that serves Duchesne and Uintah County, as well as Dinosaur, Colorado. This service is headquartered in Roosevelt, and makes daily runs throughout the area.

Sewer

Duchesne County is served by four sewer systems in Duchesne, Myton, Altamont, and Roosevelt. The Duchesne City system, constructed in 1969, has a 4,000-person capacity. Myton built a new sewer system in conjunction with its water system in the 1970's and a doubling of the existing Myton population could be absorbed by the current system. Altamont has a small lagoon with 100 existing connections. Roosevelt recently constructed a new sewage treatment facility which can handle an estimated 12,000 persons.

Duchesne County's sewer system could handle some of the proposed expansion from baseline growth; however, it is the Vernal system which is projected to receive the greatest growth. The sewer system in Vernal is currently exceeding capacity, but the community is already planning a new valley-wide 40,000-person capacity facility. Growth will have to be carefully monitored to assure that the expansion is adequate. The remainder of the Ashley Valley is on a septic tank. The community of Rangely has 3 aerated sewer lagoons with 663 hookups. The population served is 2,300 people with a capacity for 4,000 people. Capacity flow is .19 mgd, with an average flow of .16 mgd*. Dinosaur is currently constructing a sewer system to replace the septic tanks they now use.

*Source: Rangely Sewer District

TABLE R2B-8

LIBRARY

	Number of Books	Space Square Feet
Uintah County	25,209	5,808
Roosevelt City	250	440
Rangely City	N/A	N/A

TABLE R2B-9
Sewer

	Existing Connections	Capacity Flow (mgd)	Average Daily Flow (mgd)	System Type	Population Capacity	Plans for Expansion
Daggett County						
Manila	300	.8	.22	Lagoon	600	
Duchesne County						
Altamont	100	.016	.30	Evaporative	160	
Duchesne	425	.6	.25	Lagoon	2700.(4000)	Could Increase
Myton	170	.116		Evaporative Lagoon		
Roosevelt	1100	1.5	.50	Lagoon	12000	None
Uintah County						
(1)Ballard	0			Septic Tank	--	
(2)Vernal	2000	2.7	1.8	Trickling Filter	5000	See NOTE
Rangely(3)	663	.19	.16	Lagoon	4000	---

Note: Exploring the construction of an indepedent community system, abandon existing existing plant for a new valley-wide 40,000 person plant.

Source:

(1) Ballard has 200 sewer connections that are on the Roosevelt system.
Source: Uintah Basin Oil Shale Impact Study - APA 10/81

(2) Robert Nicholsen (Vernal Planning & Zoning)

(3) Rangely Sewer District

Solid Waste Disposal

Duchesne County's disposal facility is located near Roosevelt and utilizes only 30 percent of its present capacity. The cities of Duchesne, Myton and Roosevelt all have their own municipal garbage collection service.

The disposal facility in Uintah County is located near Vernal and has 90 percent of the facility unused at the present time. Vernal also has municipal garbage collection services.

Rangley has a disposal facility, but the citizens of the county must take their garbage to it. About 72 percent of this disposal facility remains unused.

Source: Moon Lake EIS

TABLE R28-10

Solid Waste Disposal

	Disposal Facilities	% of Capacity Unused	Garbage Collection o = No + = Yes
Daggett County	1	75%	o
Manila			
Duchesne County	1	70%	
Duchesne			+
Myton			+
Roosevelt			+
Uintah County	1	90%	
Vernal			+
Rangley	1	72%	o

Source: Uintah Basin Oil Shale Impact Study, APA Planning Reserach 10/81 and Rangely City Hall

Water

The Ashley Valley is served by four water districts located in Vernal, Maeser, Jensen, and the unincorporated area of Uintah County. All four systems currently obtain their water from Ashley Springs. Approximately 50 percent of the water entering the distribution system is lost through leakage. Thus, of the 9 mgd entering the distribution system, only 4.5 mgd's are metered. The system is designed to serve approximately 10,400 people and is currently overextended with a service population of 16,000. The Utah Division of Environmental Health has cited the district for "corrective action" on several issues, primarily related to inadequate size.

Planning for additional water capacity is well advanced in the Ashley Valley. A new reservoir at Red Fleet, north of Vernal, has recently been completed. A new 30 mgd aqueduct will connect the reservoir with a new treatment facility northwest of Vernal. This expansion will eventually serve 40,000-50,000 people. Additional storage capacity from a 2 million gallon tank is planned for the western side of the country.

Water distribution within the Ashley Valley is another critical area that will influence the pattern of growth. Water pressure on the southern side of the valley is currently inadequate to handle additional growth. The cost of new pumping facilities to alleviate the low pressure may be prohibitive, thus constraining the areas of growth.

Ballard purchases its water from the Ute Tribe. Roosevelt utilizes wells for its water supply. The average daily flow is 4 mgd although only 2 mgd are metered because of leakage. Problems with adequate distribution of water pressure may constrain growth in the higher north areas of Roosevelt.

Ballard is exploring the possibility of building its own water facilities, although additional water from the Ute Indians appears to be available if needed. Roosevelt is currently studying alternatives to meet the increased future demand for water supply.

Myton gets its water via a canal from the Duchesne River with a supply amount of .59 mgd and a storage capacity of .25 mgd. There are currently 170 existing connections. This system has been approved by the State of Environmental Health.

Duchesne receives its 1.35 mgd for culinary water from local springs. The city has a storage capacity of 2 mgd with 425 existing connections. The system has a "corrective action" designation from the Utah Division of Environmental Health.

Altamont, in Duchesne County, relies on springs which supply .24 mgd, for its culinary water. Ninety-four existing connections are hooked to a storage capacity of .14 mgd. The Altamont system has been approved by the Utah Health Department.

Rangley Water District has a capacity flow of 1.74 mgd and 714 connections and a storage capacity of 1 mgd.

Source: Mr. Peach - Rangely City Hall

TABLE R2B-11

	Source	Supply Amount (MGD)	Water System Storage Capacity (MGD)	Exist Connections	Storage Connections	Supply Connections*
Daggett County						
Manila	Wells	.10	.50	300	625	63
Duchesne County						
Altamont	Springs	.24	.14	94	175	150
Duchesne	Spring	1.35	2.00	425	2,500	840
Myton	Canal	.59	.25	170	310	370
Roosevelt	Wells	4.00	2.50	1,100	3,125	1,200
Uintah County						
Ashley Valley***	Springs	9.00 (4.5 as metered)	2.50	5,155	3,125	3,000
Ute Tribe	Springs	5.10	.43	560	n/a	n/a
Ballard	Ute Tribe	.30	.20	220	250	190
LaPoint	Canal	.30	.20	280	250	190
Rangely	Wells	1.74mgd	1.0	714	n/a	n/a

Source: Uintah Basin Oil Shale Impact Study, APA, 10/81 and Rangely City Hall, Mr. Peach

Standards:
* Based on 1,600 gpd per connection
** Based on 3.4 persons per connection
***Includes 4 water districts: Vernal City, Maeser, Jensen, and parts of the Ashley Valley in between.

FISCAL

Daggett County

The major jurisdictions in Daggett County are Daggett County and the Daggett School District. Daggett School District serves the entire county. In addition, Daggett Water and Sewer District serves parts of the county.

Daggett County, with an assessed valuation of $12.2 million and a mill levy of 8.50, collected $103,700 in taxes during 1980. (Table R2B-27) The 1980 budget shows total revenues of $465,900 and total expenditures of $396,800. General government accounted for the largest share of expenditures. (Table R2B-12) With a general obligation bond of $175,000 outstanding, $1,045,500 of the allowed indebtedness of $1.2 million is available for future use. (Table R2B-26)

Daggett School District has an assessed valuation of $12.2 million, but with a mill levy of 36.0 and has collected $439,400 in taxes. (Table R2B-26) Daggett School District's 1980 budget showed $833,200 in revenues and $730,000 in expenditures. (Table R2B-13) With no outstanding debts, the school district has the total bonded debt limit of $2.4 million available for future use. (Table R2B-26)

Daggett Water and Sewer collected $6,280 in taxes during 1980, with an assessed valuation of $1.6 million and a tax rate of 4.0 mills. The bonded debt limit for the water and sewer district is $942,300. (Table R2B-26 and R2B-27)

Duchesne County

Major local jurisdictions in Duchesne County are Duchesne County, Duchesne School District, the town of Altamont, and the cities of Duchesne, Myton and Roosevelt. Special service districts operating within the county include Duchesne Mosquito District and the Central Utah Water District.

In 1980 Duchesne County had an assessed valuation of $133.1 million and a mill levy of 9.05. (Table R2B-27) The county had no outstanding debts, leaving the entire allowed indebtedness of $13.3 million available for future use. (Table R2B-26) In 1980, the county had total revenues of $3.7 million and total expenditures of $4.1 million. The largest single outlay was for highway and public improvements. (Table R2B-14)

Duchesne School District in 1980 had an assessed valuation of $133.1 million, a mill levy of 38.16, and collected $5.1 million in taxes. (Table R2B-27) The 1980 budget for the school district shows $8.8 million in revenues and $9.9 million in expenditures, operating this year at a deficit. (Table R2B-15) A large portion of expenditures went for captial outlay. With $2.3 in bonded indebtedness and a bonded debt limit of $26.6 million, $24.3 million is still available for future projects. (Table R2B-26)

The revenues of Altamont are based on an assessed valuation of $343,400 and a mill levy of 22.17. During 1980, the town charged $7,600 in taxes (Table R2B-27), had total revenues of $49,500, and total expenditures of $62,500. (Table R2B-16) The town has outstanding general obligation bonds estimated at $3,800, leaving $202,200 available for future use. (Table R2B-26)

The 1980 revenue base for the city of Duchesne included an assessed valuation of $1.9 million and a mill levy of 27.00. The city charged $51,500 in taxes during 1980. (Table R2B-27) Total revenue exceeded total expenditures during 1980, with revenues equaling $773,480 and expenditures $404,340. (Table R2B-17) Duchesne has general obligation bonds totaling $113,000 currently outstanding. With a statutory debt limit of $1.1 million the city has $1 million of available debt for future use. (Table R2B-26)

In 1980 Myton charged $10,800 in taxes on an assessed valuatin of $347,300 and a mill levy of 31.00. (Table R2B-27) The 1980 revenue and expenditure data was not available. (Table R2B-27) With general obligation bonds of $102,000 currently outstanding, Myton has $106,400 available for future projects. (Table R2B-26)

Roosevelt has the largest population of any other city in Duchesne County and also has the highest assessed valuation, $6.2 million. With a mill levy of 25.45, Roosevelt collected $158,690 in taxes in 1980. (Table R2B-27) In 1980 Roosevelt had revenues totaling $1.5 million and expenditures of $1.2 million. The largest share of expenditures went for police protection. (Table R2B-19) Roosevelt has outstanding general obligation bonds totaling over $1.3 million. With an allowable indebtedness of $3.7 million, $2.4 million is available for use on future projects if necessary.

The Duchesne Mosquito District had an assessed valuation of $133.1 million a mill levy of 0.8, and collected $106,480 in taxes in 1980. (Table R2B-27) The debt limit for general obligation bonds allowed by state law was $8 million. (Table R2B-26)

Grand County

Major local governments in Grand County include Grand County, Grand County School District, and the city of Moab. Special service districts operating in the county include Grand County Water District, Moab Mosquito District, and Spanish Valley Water and Sewer.

The county had an assessed valuation of $38.3 million and a local mill levy of 15.27. Property taxes of $585,180 charged during 1980,contributed to the county's revenues. (Table R2B-27) Total revenues for Grand County in 1980 came to $2.2 million. Expenditures totaled $2.1 million, with the largest expense attributed to highway and public improvement. (Table R2B-20) The county has no general obligation bonds outstanding, leaving the entire allowable debt of $3.8 million available.

Grand County School District has the same assessed valuation as the county, at $38.8 million. The school district has a mill levy of 39.87, and in 1980 it collected $1.5 million in taxes. (Table R2B-27) The 1980 budget for the school district showed a deficit, with revenues totaling $10.4 million and expenditures $10.9 million. (Table R2B-21) The school district had general obligation bonds totaling $132,601 outstanding in 1980 with $7.5 million available for future use. (Table R2B-26)

The city of Moab had revenues in 1980 totaling $2.3 million. Expenditures for the same year came to $2.1 million with parks and recreation having the larges share. (Table R2B-22) Revenues for the city were based on an assessed valuation of $10.1 million, a 21.50 mill levy rate, and a $216,300 charge in property taxes. (Table R2B-27) Moab has a bonded debt limit of $6.0 million, and with only $519,000 outstanding, has over $5.5 million available if needed in the future. (Table R2B-26)

Grand County Water District has an assessed valuation of $38.3, a 2.00 mill levy, and collected $76,600 in taxes in 1980. The bonded debt limit by state law is $23.0 million. Currently Grand County Water District has no bonded debt. Moab Mosquito District has an allowable debt of $12.3 million, an assessed valuation of $20.4 million, and a mill levy of 1.19. In 1980 the district charged $24,300 in property taxes. Spanish Valley Water District has an assessed valuation of $4.5 million, a 4.00 mill levy, and charged $17,880 in taxes in 1980. Current indebtedness for Spanish Valley Water and Sewer is $95,000, leaving nearly $2.6 million available until the bonded debt limit is reached. (Tables R2B-26 and R2B-27)

Uintah County

The major local governments in Uintah County are Uintah County, Uintah School District, and the city of Vernal. Special service districts operating in the county include Ashley Valley Water and Sewer, Ballard Water District, Jensen Water District, Maeser Water and Sewer, Tridell-LaPoint Water District, and Uintah Water District.

In 1980, Uintah County had a 16.63 mill levy and, an assessed valuation of $102.6 million, charged $1.7 million in property taxes. (Table R2B-27) The allowable bonded debt for the county is $10.3 million. An outstanding hospital bond of $2.9 million leaves $7.9 million available for future use. (Table R2B-26) In 1980 the total revenues for the county totaled $4.4 million and expenditures were $4.6 million, with the largest share going for highways and public improvements. (Table R2B-23)

Uintah School District also had an assessed valuation of $102.6 million and, with a mill levy of 43.75, received $4.5 million in property taxes. (Table R2B-27) Total revenues for the school district were $10.4 million in fiscal year 1980, while expenditures were $10.9 million. (Table R2B-24) The school district had no general obligation bonds leaving the entire bonded debt limit of $20.5 million available. (Table R2B-26)

Vernal is the largest city in the Uintah Basin. The Assessed valuation of the city is nearly $18.8 million. The mill levy is, however, the smallest of any other town: 3.29. The property taxes charged by the city totaled $61,850 for 1980. (Table R2B-27) Vernal had revenues of $3.1 million and

expenditures of $2.6 million during 1980. The city spent over $600,000 on water and sewer services. (Table R2B-25) Vernal has a statutory debt limit of $11.3 million and, with only $1 million in outstanding general obligation bonds, has over $10 million available if needed for the future. (Table R2B-26)

Ashley Valley Water and Sewer has an assessed valuation of $16.9 million, a mill levy of 13.48, and a bonded debt limit of $10.1 million. Ballard Water District has $103,000 in outstanding debts, leaving $859,800 for future use. The assessed valuation for the District is $1.6 million and, with a 4.00 mill levy, collected 6,400 in taxes in 1980. Jensen Water District has an assessed valuation of $2.2 million and a mill levy of 4.49. With no outstanding bonds, the district has the entire allowable debt of $1.3 million available. Maeser Water and Sewer has $1.4 million available for future debt, with $380,000 currently outstanding. The water and sewer district charged $8,800 in taxes in 1980, assessing a mill levy of 2.95 on a valuation of $3.0 million. Tridell-LaPoint Water District collected $31,700 in property taxes during 1980, using a mill levy of 12.71 and an assessed valuation of $2.5 million. This district has nearly $1.4 million in available debt, with general obligation bonds currently outstanding totaling $114,100. Uintah Water District had the highest assessed valuation, $96.6 million, and the lowest mill levy 1.20. Uintah Water District has a bonded debt limited by state law of $58 million. (Tables R2B-26 and R2B-27

Colorado Area

In 1980, Rio Blanco County had an assessed value of $206.1 million. The mill levy was 8.45 and the outstanding debt was $450,000. Total revenues were approximately $5.5 million, while total expenditures in 1980 were $4.9 million. The resulting surplus was $0.6 million. For the community of Rangely, the assessed value in 1980 was $5.0 million. Total revenues were $1,293,000 while expenditures totaled $1,351,200. This resulted in a deficit of $58,200.

In 1980, Moffat County had a baseline value of $187.0 million. The mill levy was 13.85 and the outstanding debt was $2.3 million. Total revenues were $10.5 million and total expenditures were $7.4 million, leaving a surplus of $3.1 million. The community of Dinosaur in 1980 had an assessed value of $390,850. Revenues totaled $142,748, and expenditures were $80,346, resulting in a surplus of $62,402. Total outstanding debt was zero.

TABLE R28-12

FISCAL PROFILE[1]
DAGGETT COUNTY

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$9,916,243	$11,678,065	$12,205,272
Mill Levy	9.00	7.44	8.50
REVENUES			
Property Taxes	95,180	96,348	111,398
General Sales and Use Taxes	38,473	22,787	18,455
Other Taxes	4,493	2,881	3,991
Licenses and Permits	4,294	4,342	3,255
Intergovernmental Transfers	213,362	224,726	248,386
Charges for Services	39,093	39,078	40,963
Fines and Forfeitures	17,641	27,282	30,558
Miscellaneous Revenue	18,910	27,209	8,926
Contributions and Transfers	62,000	--	--
Proceeds from Sale of Bonds	250,000	--	--
TOTAL REVENUE	743,446	444,653	465,932
EXPENDITURES			
General Government	182,655	152,010	167,703
Public Safety	65,977	69,956	81,653
Public Health	6,315	3,822	4,127
Highways and Public Improvement	155,188	127,330	66,648
Parks, Recreation and Public Property	14,689	14,550	25,186
Conservation and Economic Development	--	--	--
Interest and Payments on Bonds	--	53,944	51,474
Capital Outlay for Construction	470,089	12,846	--
TOTAL EXPENDITURES	894,913	434,458	396,791

CURRENT INDEBTEDNESS (Year Ending 1980)	Amount	Year Retired
General Obligation Bonds-Courthouse	175,000	1984

[1] Includes General Fund, Debt Service Fund, Transient Room Special Revenue Fund and Capitol Project Fund.

SOURCE: County Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R28-13

FISCAL PROFILE[1]
DAGGETT SCHOOL DISTRICT

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$9,916,243	$11,678,065	$12,205,272
Mill Levy	40.00	33.73	36.00
REVENUES			
Property Taxes	214,286	424,739	427,957
Other Local Revenue	659	646	11,598
School Lunch Revenue	16,053	20,402	24,038
State Revenue	222,720	124,262	235,892
Federal Revenue	45,207	30,329	44,840
Federal Revenue via State	14,772	24,928	17,169
Payments from Other School Districts	46,071	60,653	71,750
TOTAL REVENUES	559,768	685,959	833,244
EXPENDITURES			
Administration	31,276	38,299	40,943
Instruction	227,631	259.013	302,505
Health Services	600	600	600
Pupil Transportation	37,983	41,810	51,546
Plant Operation	50,683	57,921	60,252
Plant Maintenance	33,973	40,182	25,750
School Lunch	18,317	20,282	24,171
Capital Outlay	46,983	64,325	84,507
Debt Service	--	--	--
Other	105,540	122,843	139,744
TOTAL EXPENDITURES	552,986	645,275	730,018
CURRENT INDEBTEDNESS (Year Ending 1980)			
None			

[1] Includes maintenance and operation school lunch; debt service and capital outlay and building reserve funds.
SOURCE: Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-14

FISCAL PROFILE[1]
DUCHESNE COUNTY

	Year Ending 1978[2]	Year Ending 1979[3]	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$136,687,764	$135,867,803	$133,101,533
Mill Levy	9.02	9.30	9.05
REVENUES			
Property Taxes	1,367,857	1,358,668	1,333,467
General Sales and Use Taxes	202,859	264,268	180,747
Other Taxes	2,614	7,886	1,473
Licenses and Permits	9,497	13, 190	19,913
Intergovernmental Transfers	1,149,363	1,190,134	1,510,653
Charges for Service	169,961	188,988	196,338
Fines and Forfeitures	59,173	66,599	85,332
Miscellaneous Revenue	167,692	253,523	383,968
Contributions	31,877	--	--
TOTAL REVENUE	3,160,893	3,343,256	3,711,896
EXPENDITUREs			
General Goverment	517,383	923,118	1,084,376
Public Safety	207,354	286,552	342,642
Public Health	58,071	37,673	590,578
Highways and Public Improvement	1,883,630	2,020,315	1,791,627
Parks, Recreation and Public Property	24,889	121,674	58,756
Conservation and Economic Development	35,028	36,436	---
Miscellaneous	252,752	37,525	281,057
TOTAL EXPENDITURES	2,979,107	3,176,741	4,149,036
CURRENT INDEBTEDNESS			
None			

1 Includes General Fund, Special Revenue Fund, Special Assistant Funds, and Trust and Agency Funds.
2 Does not include special revenue funds.
3 1979 data from Center for Public Affairs and Administration, University of Utah.

SOURCE: County Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-15

FISCAL PROFILE[1]
DUCHESNE COUNTY SCHOOL DISTRICT

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$136,687,764	$135,867,803	$133,101,533
Mill Levy	41.99	37.66	38.16
REVENUES			
Property Taxes	6,848,175	5,793,407	5,229,947
Other Local Revenue	518,372	481,907	497,128
School Lunch Revenue	170,832	197,024	230,278
State Revenue	300,571	718,811	1,956,213
Federal Revenue	507,260	312,073	364,969
Federal Revenue via State	157,684	267,964	270,522
Payments from Other School Districts	191,256	287,647	250,634
TOTAL REVENUES	8,093,008	8,058,833	8,799,691
EXPENDITURES			
Administration	107,879	115,864	135,152
Instruction	2,854,513	3,191,985	3,536,434
Health Services	8,312	8,180	13,320
Pupil Transportation	318,636	314,405	373,421
Plant Operation	409,378	483,641	580,424
Plant Maintenance	132,035	149,825	258,925
School Lunch	323,447	378,014	444,341
Capital Outlay	5,119,187	784,394	2,846,641
Debt Service	347,827	349,009	274,575
Other	1,299,969	1,234,380	1,486,065
TOTAL EXPENDITURES	10,921,183	7,009,697	9,949,298

CURRENT INDEBTEDNESS (Year Ending 1980)

AMOUNT	YEAR RETIRED
$115,000	1981
15,000	1983
100,000	1983
135,000	1983
1,940,000	1992
$2,305,000	

[1] Includes maintenance and operation captial outlay, debt service, school food service, tort liability and recreation funds.

SOURCE: Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-16

FISCAL PROFILE[1]
ALTAMONT

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$379,425	$366,083	$343,375
Mill Levy	25.45	22.07	22.17
REVENUES			
Property Taxes	9,962	9,842	8,016
General Sales and Use Taxes	13,845	16,509	15,051
Other Taxes	--	--	--
Licenses and Permits	176	1,101	295
Intergovernmental Transfers	23,323	5,373	7,187
Charges for Services	839	1,647	2,906
Fines and Forfeitures	--	--	--
Water and Sewer	24,060	13,354	13,722
Miscellaneous Revenues	24,342	4,699	2,300
TOTAL REVENUE	96,547	52,525	49,477
EXPENDITURES			
Police	--	--	--
Fire	42,571	971	667
Streets	11,981	2,011	1,056
General Government	7,855	28,707	37,891
Inspection	70	66	60
Court	--	--	--
City Hall Buildings	6,558	--	--
Parks and Recreation	7,062	1,871	5,692
Waste	524	415	1,550
Water and Sewer	16,212	18,545	8,729
Debt Service	2,044	4,342	2,924
Capital Improvements	11,000	--	--
Miscellaneous Expenditures	2,191	3,279	3,961
TOTAL EXPENDITURES	108,068	60,207	62,530

CURRENT INDEBTEDNESS (Year Ending 1978)

	Amount	Year Retired
General Obligation	5,500	1984
Revenue - Sewer	16,004	2001
Water	56,000	1996
Water	55,441	2117
	132,945	

[1] Includes general fund and utility fund.

SOURCE: Audited Financial Statements filed with the Utah Auditors Office.

TABLE R2B-17

FISCAL PROFILE[1]
CITY OF DUCHESNE

	Year Ending 1978[2]	Year Ending 1979	Year Ending 1980[4]
REVENUE BASE			
Assessed Valuation	$1,865,442	$1,864,789	$1,906,932
Mill Levy	26.50	26.50	27.00
REVENUES			
Property Taxes	53,353	49k360	52,387
General Sales and Use Taxes	35,856	42,805	43,064
Other Taxes	2,659	3,816	2,304
Licenses and Permits	6,053	7,845	12,248
Intergovernmental Transfers	160,784	231,250	446,273
Charges for Services	12,788	2,157	41,255
Fines and Forfeitures	10,232	16,791	11,112
Water and Sewer	--	120,371	154,751
Miscellaneous Revenues	8,270	140,242	10,085
TOTAL REVENUE	289,995	621,637	773,480
EXPENDITURES			
Police	59,363	70,500	77,230
Fire	11,448	5,740	6,435
Streets	98,039	64,195	42,605
General Government	64,428	72,110	49,368
Inspection	5,949	--	--
Court	2,882	2,573	2,879
City Hall Buildings	848	6,445	4,000
Planning	--	--	--
Parks and Recreation	41,784	35,972	42,483
Waste	12,861	21,044	23,040
Water and Sewer	--	139,034	124,976
Debt Service	--	--	5,465
Capital Improvements	--	110,936	22,410
Miscellaneous Expenditures	9,361	2,045	3,424
TOTAL EXPENDITURES	306,963	530,594	404,341

CURRENT INDEBTEDNESS[3] (Year Ending 1980)

	Amount	Year Retired
General Obligation Bonds		
Water	113,000	2003
TOTAL	113,000	

Continued

Table R28-17
Fiscal Profile
City of Duchesne (cont'd)
page 2

Revenue Bonds		
Water and Sewer	25,000	1998
Sewer Utility	50,315	2007
TOTAL	75,315	

---

1 Includes general fund, debt service, water and sewer funds.

2 Water and Sewer fund data not available for 1978.

3 Data from APA Planning and Research; "Uintah Basin Capital Facilities Study Final Report"; January 1982.

4 1980 data from audited financial statements filed with the Utah Auditor's Office

SOURCE: Center for Public Affairs and Administration

TABLE R2B-18

FISCAL PROFILE[1]
MYTON

	Year Ending 1978[2]	Year Ending 1979	Year Ending 1980[4]
REVENUE BASE			
Assessed Valuation	$340,581	$345,310	$347,345
Mill Levy	28.00	31.00	31.00
REVENUES			
Property Tax	9,539	10,738	N/A
General Sales and Use Taxes	386	1,341	
Other Taxes	2,339	2,171	
Licenses and Permits	1,124	1,400	
Intergovernmental Transfers	39,793	6,658	
Charges for Services	365	1,214	
Fines and Forfeitures	190	90	
Water and Sewer	--	--	
Miscellaneous Revenues	28,596	15,574	
TOTAL REVENUES	82,332	39,186	
EXPENDITURES			
Police	2,918	2,715	
Fire	276	2,597	
Streets	673	3,194	
General Government	37,805	22,921	
Inspection	--	--	
Court	284	432	
City Hall Buildings	--	--	
Planning	--	--	
Parks and Recreation	4,374	2,187	
Waste	--	--	
Water and Sewer	--	--	
Debt Service	--	--	
Capital Improvements	10,604	--	
Miscellaneous Expenditures	27,562	--	
TOTAL EXPENDITURES	84,496	34,046	

CURRENT INDEBTEDNESS (Year Ending 1979)

	Amount	Year Retired
General Obligation - Water	102,000	1998
Revenue - Water	184,500	1995
Sewer	22,000	1998
	206,500	

SOURCE: Audited Financial Statements filed with the Utah State Auditors Office

TABLE R2B-19

FISCAL PROFILE[1]
CITY OF ROOSEVELT

	Year Ending 1978	Year Ending 1979	Year Ending 1980[2]
REVENUE BASE			
Assessed Valuation	$5,792,505	$6,064,201	$6,235,525
Mill Levy	25.45	25.45	25.45
REVENUES			
Property Tax	152,531	156,796	102,996
General Sales and Use Taxes	255,876	296,980	396,570
Other Taxes	20,439	57,285	62,719
Licenses and Permits	22,498	26,063	29,704
Intergovernmental Transfers	369,978	655,972	173,094
Charges for Services	21,635	49,986	55,359
Fines and Forfeitures	100,281	122,072	18,218
Water and Sewer	324,391	338,833	536,711
Miscellaneous Revenues	27,437	105,516	129,036
TOTAL REVENUES	1,295,066	1,809,503	1,504,407
EXPENDITURES			
Police	170,988	246,741	300,156
Fire	16,556	21,086	75,463
Streets	59,969	111,096	75,463
General Government	225,999	102,343	133,529
Inspection	--	4,369	8,021
Court	6,420	24,703	28,394
City Hall Buildings	7,107	27,038	26,900
Planning	--	--	--
Parks and Recreation	133,641	136,414	169,803
Waste	58,884	69,386	79,446
Water and Sewer	367,655	430,111	44,894
Debt Service	136,981	140,402	190,062
Capital Improvements	0	303,051	--
Miscellaneous Expenditures	14,550	14,098	153,310
TOTAL EXPENDITURES	1,198,750	1,630,838	1,238,686

CURRENT INDEBTEDNESS[3] (Year Ending 1980)

	Amount	Year Retired
General Obligation Bonds		
Various Water and Sewer	855,000	1996
SID	335,000	1987
Park	150,000	1993
Xerox Machine	2,096	1983
TOTAL	1,342,096	

Continued

TABLE R2B-19
Fiscal Profiles
City of Roosevelt (Cont'd)
Page 2

REVENUE BONDS	Amount	Year Retired
Various Water and Sewer	500,012	1986
TOTAL	500,012	
SPECIAL ASSESSMENT BONDS	588,000	1987
TOTAL	588,000	

---

1 Includes general fund debt service, water and sewer and utility funds.

2 1980 data from audited financial statements filed with the Utah State Auditors Office.

3 Data from APA Planning and Research; "Uintah Basin Capital Facilities Study Final Report" January 1982

SOURCE: Center for Public Affairs and Administration, University of Utah

TABLE R2B-20

FISCAL PROFILE[1]
GRAND COUNTY

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$30,257,387	$34,714,948	$38,322,000
Mill Levy	13.75	14.15	15.27
REVENUES			
Property Taxes	407,233	470,439	560,467
General Sales and Use Taxes	157,948	153,842	219,745
Other Taxes	54,154	45,492	58,424
Licenses and Permits	4,639	12,210	9,227
Intergovernmental Transfers	527,087	765,479	1,114,987
Charges for Services	137,141	117,969	123,506
Fines and Forfeitures	65,247	62,418	58,435
Miscellaneous Revenues	76,758	84,376	97,944
Contributions and Transfers	--	--	--
TOTAL REVENUES	1,430,207	1,712,325	2,242,735
EXPENDITURES			
General Government	341,768	368,206	407,171
Public Safety	138,122	220,850	313,914
Public Health	25,773	45,171	43,844
Highways and Public Improvement	916,540	625,211	518,288
Parks, Recreation and Public Property	24,212	51,372	469,701
Conservation and Economic Development	16,417	16,869	15,818
Miscellaneous	358,375	336,898	328,224
TOTAL	1,821,207	1,664,577	2,096,960
CURRENT INDEBTEDNESS			
None			

[1] Includes general fund and revenue fund.

SOURCE: County Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-21

FISCAL PROFILE[1]
GRAND COUNTY SCHOOL DISTRICT

	Year Ending 1978	Year Ending 1979[2]	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$30,257,387	$34,714,948	$38,322,000
Mill Levy	41.50	37.46	39.87
REVENUES			
Property Taxes	N/A	1,281,519	1,527,907
Other Local Revenue		54,414	2,507,666
School Lunch Revenue		92,477	580,466
State Revenue		1,394,194	4,641,053
Federal Revenue		140,368	750,114
Federal Revenue via State		96,291	398,642
Payments from Other School Districts		8,505	6,204
TOTAL REVENUES		3,067,768	10,412,052
EXPENDITURES			
Administration	N/A	97,769	221,132
Instruction		1,524,086	4,220,294
Health Services		3,110	34,747
Pupil Transportation		80,919	607,345
Plant Operation		256,429	778,902
Plant Maintenance		99,039	261,425
School Lunch		92,193	526,214
Capital Outlay		244,529	2,040,905
Debt Service		132,504	108,047
Other		588,488	2,068,984
TOTAL EXPENDITURES		3,119,026	10,867,995

CURRENT INDEBTEDNESS (Year Ending 1980)

	Amount
General Obligation Bonds	86,688
	45,913
	132,601

[1] Includes maintenance and operation special transportation, Utah government immunity, recreation, capital outlay and debt service and school lunch funds.

[2] 1979 includes only maintenance and operation, tort liability, recreation, capital outlay and debt service and food service funds.

SOURCE: Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-22

FISCAL PROFILE[1]
MOAB

	Year Ending 1978[2]	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$8,523,209	$9,480,520	$10,060,515
Mill Levy	21.50	21.50	21.50
REVENUES			
Property Tax	183,731	199,245	272,733
General Sales and Use Taxes	256,055	318,021	355,840
Other Taxes	17,303	32,349	28,476
Licenses and Permits	139,628	150,173	167,306
Intergovernmental Transfers	121,453	213,413	582,444
Charges for Services	168,154	167,232	181,004
Fines and Forfeitures	47,141	30,423	31,237
Water and Sewer	310,817	341,153	328,937
Miscellaneous Revenues	68,819	153,352	430,853
TOTAL REVENUES	1,313,101	1,605,361	2,328,830
EXPENDITURES			
Police	128,632	160,243	173,915
Fire	--	--	--
Streets	168,789	184,776	271,615
General Government	85,704	100,550	128,043
Inspection	28,431	30,926	32,982
Court	38,498	18,973	29,830
City Hall Buildings	13,904	14,456	19,907
Planning	--	--	--
Parks and Recreation	52,654	48,636	372,518
Waste	158,557	168,201	181,538
Water and Sewer	72,129	90,710	336,814
Debt Service	116,210	156,607	100,488
Capital Improvements	--	--	--
Miscellaneous Expenditures[3]	242,176	159,855	464,387
TOTAL EXPENDITURES	1,105,684	1,133,933	2,112,037

CURRENT INDEBTEDNESS (Year Endings 1980)

	Amount	Year Retired
General Obligation	519,000	N/A
Revenue Bonds	325,000	N/A

Continued

TABLE R2B-22
Fiscal Profiles
City of Moab (Cont'd)
Page 2

[1] Includes general fund, debt service fund, capital projects fund, enterprise fund,trust and agency funds, (except employee benefits & withholding) and special assessment fund.

[2] 1978 data does not include trust and agency fund or special assessment fund.

[3] Miscellaneous expenditures include: alcohol enforcement, dog pound, and flood control expenditures along with miscellaneous expenditures.

SOURCE: Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-23

FISCAL PROFILE[1]
UNITAH COUNTY

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$73,838,401	$88,635,893	$102,570,979
Mill Levy	15.90	16.28	16.36
REVENUES			
Property Taxes	1,182,604	1,468,105	1,699,066
General Sales and Use Taxes	393,297	219,712	189,224
Other Taxes	33,747	32,691	53,262
Licenses and Permits	27,483	32,841	23,753
Intergovernmental Transfers	1,320,737	1,292,055	1,473,813
Charges for Services	182,334	194,786	223,685
Fines and Forfeitures	90,695	134,954	164,089
Miscellaneous Revenue	284,270	382,517	479,574
Contributions and Transfers	31,000	34,996	95,743
TOTAL REVENUES	3,546,167	3,792,657	4,402,209
EXPENDITURES			
General Government	633,542	739,483	839,749
Public Safety	285,289	338,493	466,188
Public Health	287,086	425,518	1,037,827
Highways and Public Improvement	843,969	930,040	1,445,616
Parks, Recreation and Public Property	305,052	420,902	429,056
Conservation and Economic Development	147,252	88,826	137,202
Interest and Payments on Bonds	--	195,232	251,940
TOTAL EXPENDITURES	2,502,190	3,137,851	4,607,578

CURRENT INDEBTEDNESS (Year Ending 1980)

	Amount	Year Retired
General Obligation Bonds-Hospital	2,375,000	1993

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[1] Includes General Fund, Council on Aging Special Revenue Fund, Transient Room Special Fund, Debt Service Fund.

SOURCE: County Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-24

FISCAL PROFILE[1]
UNITAH SCHOOL DISTRICT

	Year Ending 1978	Year Ending 1979	Year Ending 1980
REVENUE BASE			
Assessed Valuation	$73,838,401	$88,635,893	$102,570,979
Mill Levy	46.57	40.57	43.75
REVENUES			
Property Taxes	3,003,773	3,490,094	3,711,142
Other Local Revenue	179,951	280,572	324,431
School Lunch Revenue	250,600	307,283	316,900
State Revenue	3,792,000	4,105,344	4,713,720
Federal Revenue	610,637	476,721	750,114
Federal Revenue via State	421,818	528,494	589,541
Payments from Other School Districts	--	101,307	6,204
TOTAL REVENUES	8,258,779	9,289,815	10,412,052
EXPENDITURES			
Administration	155,987	164,459	221,132
Instruction	3,659,687	3,923,475	4,220,294
Health Services	16,227	5,893	34,747
Pupil Transportation	355,503	432,983	607,345
Plant Operation	582,035	635,107	773,902
Plant Maintenance	211,149	279,703	261,425
School Lunch	484,216	491,397	526,214
Capital Outlay	1,031,570	1,958,315	2,040,905
Debt Service	--	73,393	108,047
Other	1,555,039	1,743,333	2,068,984
TOTAL EXPENDITURES	8,051,413	9,708,058	10,862,995

CURRENT INDEBTEDNESS (Year Ending 1980)
None

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[1] Includes maintenance and operation, special transportation, Utah Government immunity, recreation, capital outlay, debt service and school lunch fund.

SOURCE: Audited Financial Statements filed with the Utah State Auditors Office.

TABLE R2B-25

FISCAL PROFILE[1]
CITY OF VERNAL

	Year Ending 1978	Year Ending 1979	Year Ending 1980[2]
REVENUE BASE			
Assessed Valuation	$15,189,903	$16,335,300	$18,798,778
Mill Levy	3.50	3.24	3.29
REVENUES			
Property Taxes	42,584	39,735	55,605
General Sales and Use Taxes	440,528	908,615	1,051,258
Other Taxes	25,116	48,451	39,712
Licenses and Permits	44,542	35,094	39,663
Intergovernmental Transfers	162,441	391,431	247,117
Charges for Services	36,208	35,567	175,878
Fines and Forfeitures	131,364	168,025	45,917
Water and Sewer	626,214	775,917	977,860
Miscellaneous Revenues	78,886	102,409	514,079
TOTAL REVENUES	1,587,883	2,505,244	3,147,089
EXPENDITURES			
Police	286,646	348,729	413,240
Fire	24,278	40,374	48,908
Streets	139,589	148,279	233,420
General Government	101,530	167,623	309,958
Inspection	25,425	27,265	29,271
Court	12,300	--	--
City Hall Buildings	16,990	22,404	70,004
Planning	100	49,254	34,451
Parks and Recreation	174,118	179,327	116,641
Waste	151,894	179,824	203,082
Water and Sewer	532,611	512,559	609,350
Debt Service	56,390	54,677	28,800
Capital Improvements	--	236,921	181,838
Miscellaneous Expenditures	14,729	14,990	272,892
TOTAL EXPENDITURES	1,536,600	1,982,226	2,551,855

[1] Includes general fund, debt service, water and sewer funds.

[2] 1980 data from audited financial statements filed with the Utah State Auditors Office

SOURCE: Center for Public Affairs and Administration, University of Utah

TABLE R2B-26

1980 BONDED DEBT LIMIT, CURRENT BONDED DEBT AND AVAILABLE DEBT

	Bonded Debt Limit [a,b]	Current Bonded Debt	Available Debt
SCHOOL DISTRICTS			
Daggett	$ 2,441,100	$ -0-	$ 2,441,100
Duchesne	26,620,300	2,305,000	24,315,300
Grand	7,664,400	132,600	7,531,800
Uintah	20,514,200	-0-	20,514,200
LOCAL GOVERNMENTS			
Daggett County	1,220,500	175,000	1,045,500
Duchesne County	13,310,200	-0-	13,310,200
Altamont	206,000	3,800[d]	202,200
Duchesne	1,144,200	113,000	1,031,200
Myton	208,400	102,000	106,400
Roosevelt	3,741,300	1,342,100	2,399,200
Grand County	3,832,200	-0-	3,832,200
Moab	6,036,300	519,000	5,517,300
Uintah County	10,257,100	2,375,000	7,882,100
Vernal	11,279,300	1,045,000	10,234,300
SPECIAL SERVICE DISTRICTS			
Daggett County Water & Sewer	942,300	N/A	N/A
Duchesne Mosquito District	7,986,100	N/A	N/A
Grand County Water District	22,993,300	-0-	22,993,300
Moab Mosquito District	12,254,200	N/A	N/A
Spanish Valley Water & Sewer	2,682,300	95,000[c]	2,587,300
Ashley Valley Water & Sewer	10,125,600	N/A	N/A
Ballard Water District	962,800	108,000[c]	859,800
Jensen Water District	1,349,000	-0-[c]	1,349,000
Maeser Water & Sewer	1,794,800	380,000	1,414,800
Tridell-LaPoint Water District	1,496,900	114,100[c]	1,382,800
Uintah Water District	57,985,400	N/A	N/A

Footnotes: See following page

a. The formula for General Obligation Bonding Capacity is:
Assessed Valuation x 5 x % Limitation = G.O. Bonding Capacity
% Limitation = 2% for Counties
4% for School Districts
12% for Third Class Cities and Towns (8% of which can only be used for water, sewer, lighting)
12% for Special Service Districts

(See Constitution of Utah, Article XIV Section 4; Utah Code Annotated II-23-16, and 59-5-1 as ammended 1981.)

b. Debt limit for cities reflects the additional 8% limitation for water, sewer, and lighting.

c. Current indebtedness for these special service districts came from data on Community Development Block Grant applications filed with the Department of Community and Economic Development.

d. Estimated.

SOURCE: Utah Energy Office derived bonded debt limit and available debt from Utah State Code Annotated. Current bonded debt from Audited Financial Statements filed with the Utah State Auditor's Office, unless otherwise noted.

TABLE R2B-27

1980 ASSESSED VALUATION, MILL LEVY, AND PROPERTY TAXES CHARGED

	Assessed Valuation 1980	Mill Levy 1980	Property Taxes Charged 1980
SCHOOL DISTRICTS			
Daggett	$ 12,205,272	36.00	$ 439,390
Duchesne	133,101,533	38.16	5,079,155
Grand	38,322,211	39.87	1,527,907
Uintah	102,570,979	43.75	4,487,480
LOCAL GOVERNMENTS			
Daggett County	12,205,272	8.50	103,745
Duchesne County	133,101,533	9.05	1,204,569
Altamont	343,375	22.17	7,613
Duchesne	1,906,932	27.00	51,487
Myton	347,345	31.00	10,768
Roosevelt	6,235,525	25.45	158,694
Grand County	38,322,211	15.27	585,180
Moab	10,060,515	21.50	216,301
Uintah County	102,570,979	16.36	1,678,061
Vernal	18,798,778	3.29	61,848
SPECIAL SERVICE DISTRICTS			
Daggett County Water & Sewer	1,570,532	4.00	6,282
Duchesne Mosquito District	133,101,533	0.80	106,481
Grand County Water District	38,322,211	2.00	76,644
Moab Mosquito District	20,423,691	1.19	24,304
Spanish Valley Water District	4,470,439	4.00	17,882
Ashley Valley Water & Sewer	16,875,982	13.48	227,488
Ballard Water District	1,604,761	4.00	6,419
Jensen Water District	2,248,284	4.45	10,095
Maeser Water & Sewer	2,991,400	2.95	8,825
Tridell-LaPoint Water District	2,494,753	12.71	31,708
Uintah Water District	96,642,370	1.20	115,971

1. The property taxes charged shown on this table may not agree with those shown on the fiscal profiles since the fiscal profiles include delinquent taxes.

SOURCE: Utah Foundation, "Statistical Review of Government in Utah," 1981 Edition.

Fiscal Impact Problems

Problem: Most of the major energy resources of the Rocky Mountain West are located in remote areas, far from major centers of population. This is especially true in the case of oil shale development in Utah. The growth associated with this energy development is going to effect the primarily small, rural and isolated communities of the Uintah Basin.

Most communities and their residents welcome the anticipated economic growth and its benefits and generally it is agreed that the economic and fiscal growth associated with energy resource development in the long run does bring economic properity and a better quality of life to those communities. However, small communities such as those in the Uintah Basin, are often in the short run unable to handle the problems associated with rapid or "boomtown" growth. These problems center around the need for increased capital facilities and services such as schools, healthcare, fire and police protection, water, sewage, waste removal, streets and highways, housing, recreational facilities, welfare, etc.

Financial problems and issues that communities face in light of the oil shale development are:

1. Uncertainty regarding the resource development and the future tax revenues. There is always the chance that the planned development will not occur and that bonds and bond anticipation notes will then become excessively burdensome for the communities. Residents and investors tend to be unwilling to expand services and facilities until it is clear what the ultimate population will be.
2. Local governments limited capacity to finance additional public facilities and services. Constitutional and statutory debt limits and mill levy rates exist which make it virtually impossible for communities to go into a great amount of debt now, while anticipating the revenues in the future. Elimination of debt limits, and state or industry guarantee of loans could help alleviate this problem.

3. Time lag. There is a time lag between the immediate need for local government expenditures on capital facilities and services, and the eventual receipt of the increased tax revenue after the energy development is operational.

4. Distribution of tax revenues. Most of the resource development in Utah will occur in rural unincorporated areas which are under county taxing jurisdictions. But the people working on the developments will probably live in the closest town or city, or even in communities in adjacent counties. Utah law prohibits different jurisdictions from sharing tax revenues. Jurisdictions should be allowed to share the increased tax base and revenues.

5. Inadequacy of Traditional Financing Mechanisms. Inaditional sources for financing community developments (taxes, bonds, federal grants and loans) are proving neither sufficient nor timely with respect to the problems of boom town growth. In addition, long term residents may be unwilling to vote to support bonds to support newcomers, especially if the population influx is considered temporary. Other sources of financing must be found if the Uintah Basin is to avoid many of the typical boom town problems identified here.

In the context of these problems, decision makers should consider who benefits from rapid growth and who should pay for them. Creative ways of spreading the costs among those who receive the benefits of development will have to be found.

SECTION R2C

Transportation

Air

The seven airports within or near the study area are shown in Figure R2C-1. The 1982 Utah State Airport System Plan has recently been completed. This report inventories existing facilities and projected facility needs for the year 2000. Projections for increased aircraft activity resulted from a report entitled Utah: 2000 - A High Development Scenario published by the State Planning Coordinator's Office. The airport plan currently lists 48,900 operations per year from these seven facilities. Projected year 2000 usage will be approximately 98,000 operations per year, which will represent a near doubling of aircraft operations. (This projection would not include any growth from oil shale development). The largest increase is projected at the Vernal airport, with an approximate 114 percent increase in aircraft operations. Table R2C-1 lists the existing facilities and proposed operations for the seven airports. The old Green River airport is projected to be phased out within the next three years due to the construction of the new Green River airport.

FIGURE R2C-1

UTAH'S MAJOR PUBLIC USE AIRPORTS

TABLE R2C-1

AIRPORT SUMMARY*

NAME (Owner)	CLASSIFICATION	EXISTING MAJOR RUNWAY LENGTH	WIDTH	SURFACE	LIGHTS	BASED AIRCRAFT	OPERATIONS PER YEAR	PROJECTED-YEAR 2000 BASED AIRCRAFT	OPERATIONS PER YEAR	IMPROVEMENT COST (1980 Dollars)
Duchesne Municipal (Duchesne City)	Basic Utility	5,800'	60'	Asphalt	Medium Intensity Runway Lights	15	7,500	23	11,500	839,000
Dutch John (U.S. Nat'l Forest Service)	Basic Utility	7,350'	100'	Turf		0	2,000	2	4,100	51,000
Manila (Daggett County)	Basic Utility	5,300'	60'	Asphalt	Medium Intensity Runway Lights	0	2,800	1	3,400	$195,000
Roosevelt Municipal (Roosevelt City)	Basic Utility	6,500'	60'	Asphalt	Medium Intensity Runway Lights	1	2,700	2	3,400	$40,100
Vernal (Vernal City & Uintah Co.)	Basic Utility	6,601'	150'	Asphalt	Medium Intensity Runway Lights	35	27,000	75	57,825	$139,000
Green River (Old) (Green River City)	Basic Utility	4,200'	70'	Asphalt	Low Intensity Runway Lights	8	6,900	Airport to be closed by 1985		
Green River Municipal (New) (Green River City)	Basic Utility	5,600'	75'	Asphalt	Medium Intensity Runway Lights			20	17,250	$101,000

*Utah State Airport System Plan update 1981.

The Vernal airport is jointly owned by Vernal City and Uintah County. This airport with its has paved runways, is the busiest airport in the Uintah Basin. The majority of its 27,000 yearly landings are made by small, private planes. Thirty-five aircraft are based at this airport. All current plans for improvements will take place before 1990 . These improvements include: installation of medium intensity taxiway lights, reconstruction of the aircraft parking apron, expansion of the automobile parking area, construction of a new terminal building, and construction of an airport boundary fence. These construction plans will cost about $139,000.

Duchesne County has 2 airports. The Duchesne minicipal airport, owned by the City of Duchesne, has 15 based airplanes and receives about 7,500 landings per year. Most of the planes are small and land on a paved runway. The following plans for expansion should take place by 1985: sealcoat all pavement, widen of the runway, construct a new operations building, pave the airport access road, pave the tie-down apron, fence the airport boundary, and purchase a clear zone area. By the year 2000 a new taxiway will be constructed, and all the pavement will be overlaid. Estimated costs for these plans are approximately $839,000.

Duchesne County's second airport is the Roosevelt Municipal Airport owned by the City of Roosevelt. This airport has a paved runway and receives 2,700 landings per year by small 4-5 passenger aircraft. One airplane is based at this airport. Current plans are to maintain the facility through 1990, at which time the city will widen the runway and overlay all pavement at a cost of $401,000.

The airport in Manilla has a paved runway and receives approximately 2,800 landings per year, most of which occur during the summer tourist season. No planes are based at the airport, and most of the traffic received here are small 4-5 passenger planes. Plans are to maintain the present facilities through 1985; however, in 1990 all the pavement will be overlaid, and the aircraft parking apron will be expanded. The cost of this future expansion is estimated to be $195,000.

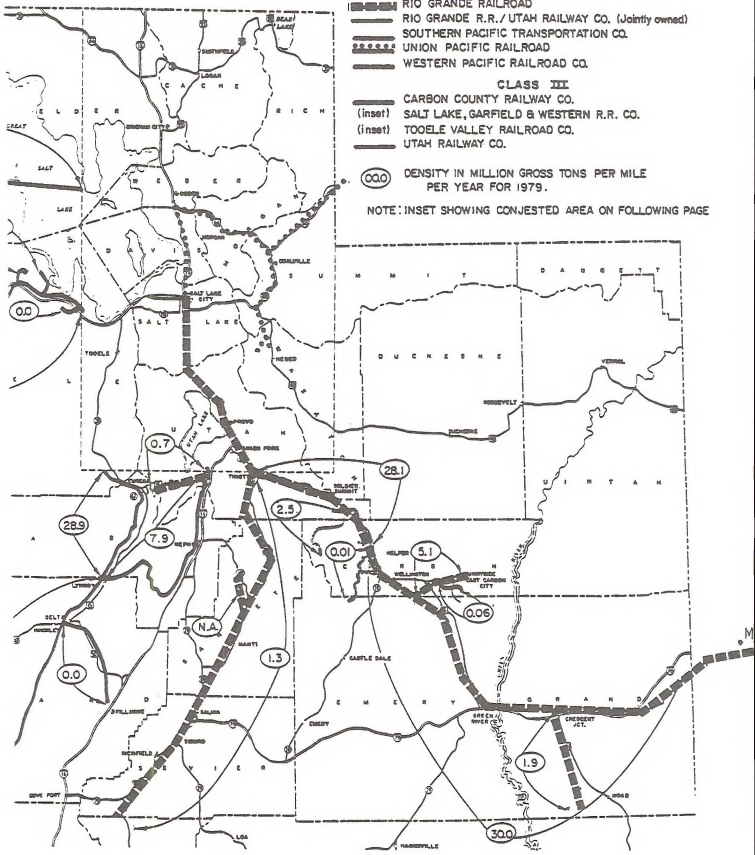
The Dutch John airport, an unpaved runway, receives 2,000 landings per year from small 5-passenger airplanes. Aircraft basing facilities are unavailable. Through 1985, plans for expansion and maintenance include: correcting the drainage problems on the runway, paving the tie-down area, and grading and maintaining the unpaved runway. After 1990, plans will be considered to pave the runway. Estimated costs for expansion are $51,000.

Presently 2 airports are located near Green River City and Grand/Emery Counties. The old and new Green River municipal airports are both owned by the city of Green River. The old airport will be closed by 1985, when the new airport will begin its services. The old airport presently receives 6,900 landings per year by small aircraft on its paved runway. At the present time, the airport has 8 based airplanes. Plans for the new airport include: construction of a new access road, installation of telephones, construction of a paved aircraft parking apron, and construction of a fence around the airport boundary. Costs of these plans will be approximately of $101,000.

Rail

The Uintah Basin currently has no rail service, and the 1980 Utah State Rail Plan does not indicate future development of services in the study area. The closest railheads are 120 miles or more from the synfuel project sites. As shown in Figure R2C-2, the Union Pacific operates to the west and north of the study area. The Denver and Rio Grande Western Railroad operates (D&RGW) west, south and east of the synfuel projects. The railheads for the UP are located in Salt Lake City and Park City, Utah. From those railheads, U.S. 40 is the most direct route to the Vernal area. The D&RGW railheads are located at Helper, Utah; Mack, Colorado; and Craig, Colorado. From Craig, Colorado, U.S. 40 will be the most direct route to the synfuel project sites. From Mack, Colorado, route 139 will be the shortest route to the sunfuels projects. Colorado State 139 is a north-south highway linking U.S. 40 with I-70 along the western border of Colorado. The rural highway crosses over Douglas Pass and connects Mack, Colorado with Rangely, Colorado. The total length of this road is approximately 75 miles. Some operational problems may exist in the transporting of heavy or bulky equipment over this route. A permit to allow its use will probably be required, depending on the weight of the load. Traffic volume on Route 139 varies between 430 and 1,100 vehicles per day, which should pose no capacity or level-of-service problems.

FIGURE R2C-2



Source: Utah State Rail Plan

Public Transportation*

Public transportation in the Uintah Basin is operated by both private companies and governmental agencies. Continental Trailways and Wilkins Transportation are the private carriers. Public transportation for the elderly and handicapped is operated through the Uintah Basin Association of Governments, Uintah County Council on Aging, and senior citizen groups.

Continental Trailways provides service to the Uintah Basin via U.S. 40. Two westbound buses daily pass through the area destined for Salt Lake City; 2 eastbound buses destined for Denver are scheduled daily. All buses have a 45-passenger seating capacity. Full service agency stations are located in Vernal, Roosevelt, Myton, and Duchesne.

Wilkins Transportation has authority to transport people to and from any point in the Uintah Basin and to and from the national forest land in Wasatch County in addition they have charter authority to anyplace in the United States from the same area. Charter service is provided on a national and local basis for river trip participants, the Ute Indian Tribe, senior citizens, church groups, and others. Three round trips per day of commuter and freight service are provided between Bonanza and Vernal, with an average of approximtely 170 passengers per day. Service to Dinosaur National Park averages approximately 2,000 passengers per day during the peak season. Service will be expanded to meet all reasonable transportation demands as they occur.

The Uintah County Council on Aging administers a program for public transportation for the elderly, handicapped, and disadvantaged minorities in Uintah County. Two vans (seating 22 persons) and 4 automobiles are available in the program. Dial-a-ride service is provided for unscheduled service. Regular transportation for meals and social activities from Vernal to the Tridell and LaPoint areas are provided on a weekly basis.

Transportation for the elderly and handicapped is also provided in Duchesne County. A 12-passenger van is operated out of Duchesne, a 15-passenger van is based in Neola, and a privately owned 12-passenger van is based in Roosevelt. Transportation is provided for meals, medical requirements, and special activities within and out of Duchesne County.

*Van Wagoner & Associates, Inc., Uintah Basin Transportation Study, 1980.

The Ute Indian Tribe currently operates two mini-buses for public transportation on the reservation. The buses were obtained from a grant and sponsored by the Federal Highway Administration. An additional 12-passenger van will probably be available and operating in 1981.

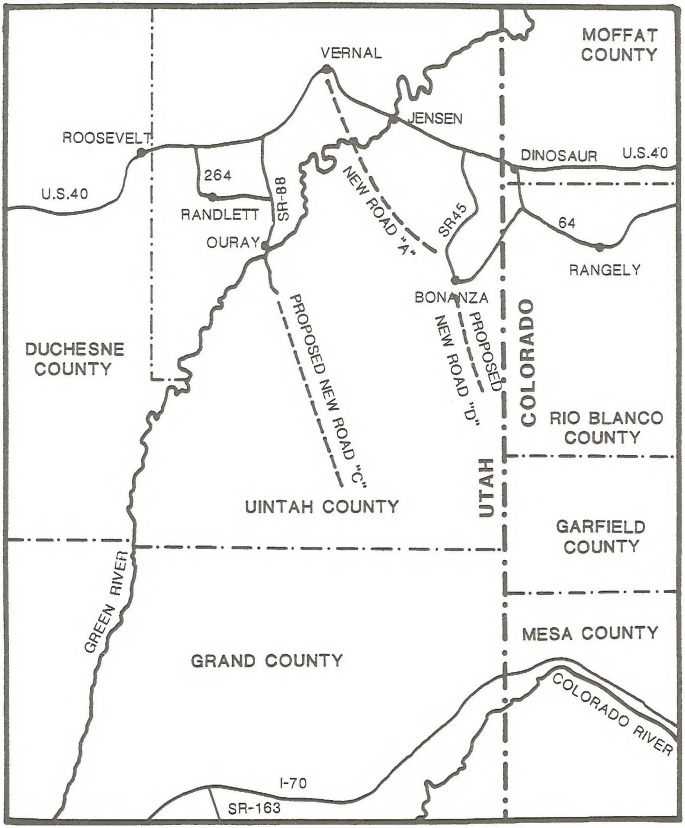
Highways

The road network within the study area consists of many differing facilities ranging from a two lane principal arterial to four-wheel-drive dirt roads. Much of the area is dominated by dirt roads. The majority of the paved facilities are located in the northern portion of the study area. Figure R2C-3 illustrates the road network within the study areas and new roads now being constructed and proposed by the Uintah Basin Transportation Study completed in 1981 by Wayne Van Wagoner and Associates for the Utah Department of Transportation.

There are five state roads which carry the majority of traffic in the area. These roads are: I-70, U.S. 40, State Route (S.R.) 88, .S.R. 45 and Colorado 64. Interstate 70 travels through the southern section of the study area. This is a four lane facility constructed to Interstate Standards. I-70 originates on the east coast and travels through Denver, and is proposed to link up with I-15 in Central Utah. U.S. 40 travels from Atlantic City, N.J. to San Francisco, California and is the major facility in the study area. U.S. 40 is one of the major highway links between Salt Lake City and Denver. Colorado route 64 travel east-west between Dinosaur and Meeker, Colorado. It is a two lane, asphalt facility. Utah routes 45 and 88 travel north-south and intersect with U.S. 40. They are two lane, major collector facilities. S.R. 45 is paved between Bonanza and U.S. 40. S.R. 88 is paved between Ouray and U.S. 40.

A new road that will link Vernal and Bonanza is under construction. This road is designated as new road "A" on Figure R2C-3. An inventory of these major facilities is given in Table R2C-2.

FIGURE R2C-3



STUDY AREA HIGH SYSTEM

TABLE R2C-2

TRANSPORTATION DATA CHART *
Existing System

Route Link	HIGHWAY CHARACTERISTICS Number Lanes	Width (Ft.)	Length (Miles)	MILES DEFICIENT Oper. Speed	Width (Ft.)	Number Lanes	TRAFFIC 1981 AADT	Funct. Class.	ADDITIONAL DATA Heavy Trucks	Accident Per MVM	Highway System	LEVEL OF SERVICE V/C	LOS
U.S.40													
1. Duchesne-Uintah Co. Line to SR 88	2-3	36-48	15.26	15.10	15.10	15.10	4,155-2,865	Prin. Art	8-11	2.90	FAP	.44 .30	C B
2. SR 88 to S.W. Vernal City Limits	2-3	36-48	12.08	10.31	10.31	10.31	3,085	Prin. Art	8-11	2.90	FAP	.32	B
3. S.W. Vernal City Limits To Vernal Main Street	2	36	0.87	0.87	0.87	0.87	19,400	Prin. Art	8-10	--	FAP	--	--
4. Vernal Main St. to Fifth East Street	4	72	1.40	1.40	1.40	--	--	Prin. Art	8-10	--	FAP	--	--
5. Fifth East Street to East City Limits	2	34	2.01	--	2.01	--		Prin. Art	8-10	2.90	FAP	--	--
6. Vernal East City Limits to SR 149	2	34	10.34	4.38	10.35	4.38	4,200	Prin. Art	8-10	2.90	FAP	.47	C
7. SR 149 to SR 45	2	34-36	11.58	0.71	11.58	--	1,900	Prin. Art	20.1	2.90	FAP	.23	B
8. SR 45 to Utah-Colorado Stateline	2	32	5.95	--	5.95	--	1,585	Prin. Art	20.0	2.90	FAP	.20	B
9. Utah/Colo to Dinosaur	2	32	--	--	--	--	1,400 (1980)	--	23.6	--	FAP	--	--
COLO. 64													
1. Dinosaur to Rangely	2	--	--	--	--	--	890-2,950 (1980)	--	8.81	--	--	.10 .32	A B
S.R. 88													
1. U.S. 40 to Randlett Rd.	2	24	6.96	.38	6.96	--	330	Major Coll	--	2.42	FAS	.05	A
2. Randlett Rd to Green River Bridge	2	26	9.91	--	9.91	--	300	Major Coll	--	2.42	FAS	.06	A
New Road "C"													
1. Green River Bridge to TOSCO Road to Geokinetics	--	--	33.0	--	--	--	--	--	--	--	--	--	--
New Road "A"													
1. S.E. Vernal City Limits to TOSCO Road to SR 45	--	--	28.8	--	--	--	--	--	--	--	--	--	--
SR45													
1. U.S. 40 to New Road "A"	2	32	5.95	--	5.95	--	285	Major Coll	23.5	--	FAS	.04	A
2. New Road "A" to Bonanza	2	20	4.86	0.40	4.86	0.40	300	Major Coll	23.5	--	FAS	.04	A
New Road "D"													
1. Bonanza to White River Shale	--	--	5.0	--	--	--	--	--	--	--	--	--	--
I-70													
1. SR 163 to Utah/Colo Stateline	4	--	--	--	--	--	3,435	Interstate	20.6	--	FAP	.07	A

*Per MVM - Per million vehicle miles
FAP - Federal-Aid Primary
FAS - Federal-Aid Secondary
V/C - Volume to Capacity Ratio
LOS - Level-of-Service

* Most of this information was compiled in the Uintah Basin Transportation Study, 1980 by Van Wagoner

TABLE R2C-3

TORICAL TRAFFIC TRENDS

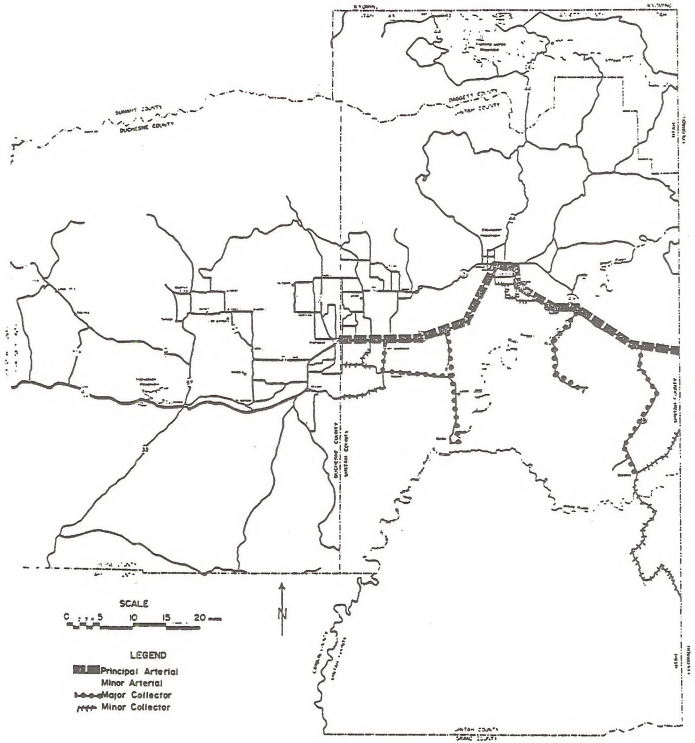
Route 264 and 262 are the two designated local county routes. Route 264, most of which is located on the Uintah and Ouray Indian Reservation, originates at U.S. 40 and travels through the towns of Fort Duchesne and Randlett. Route 262 extends south from U.S. 40 and parallels the Green River. Another local road exists between Bonanza and Colorado 64. All of these roads are narrow, have no shoulders, poor surfaces, and poor sight distance. Major reconstruction would be required on any of these local facilities to handle any substantial amount of traffic.

Other roads within the study area are either dirt or surfaced with "native asphalt",the material that is extracted from many of the mining operations in the area.

The road network in the study area is a combination of; principal arterials, major collectors, minor collectors, and local facilities. Each is classified by its function. Principal arterials are those highways, including extensions into and through incorporated places, which serve interstate and intrastate traffic movements and are of equal importance as Utah's Interstate system. In conjunction with the Interstate System, principal arterials form the major framework of the state's Interstate Highway Transportation System. Major collectors are those highways which provide service to population centers of 100 to 2,500 and serve as important feeders to highways of greater functional importance. They provide service to the larger employment centers in the county, as well as to recreation areas which receive greater than local recognition. Minor collectors provide service to smaller population and employment centers and to local recreation areas. Collector roads form the "backbone" of a network to collect local traffic.

All of the roads in the state of Utah have been categorized by functional classification. Figure R2C-4 shows the functional classification system for the Uintah Basin. U.S. 40 a principal arterial, is the primary route through the area. The minor collectors in the study area are S.R. 88, S.R. 45, and county routes 262 and 264.

FIGURE R2C-4



FUNCTIONAL CLASSIFICATION SYSTEM

The Utah Department of Transportation has developed criteria for measuring minimum tolerable conditions on rural arterials and collectors. This criteria is based primarily on traffic volumes and functional classification. The roads then are evaluated according to terrain, highway geometrics, structural adequacy, and safety conditions.

According to the Uintah Basin Transportation Study, a study which was conducted in the Uintah Basin by Wayne Van Wagoner & Associates, deficiencies of pavement surface, operating speed, lane width and number of lanes have been identified. A deficient pavement surface will require some form of resurfacing. In the Uintah Basin 100 percent of U.S. 40 was found to be deficient in pavement surface. Approximately 21.9 miles of S.R. 45 isdeficient in pavement surface, and about 16.9 miles of S.R. 88. This indicates that 100 percent of the major state roads in the project area currently require some form of resurfacing. No data was available for I-70, although a visual inspection indicated no significant deficiencies.

The highway network in the project area also was found to be deficient in operating speed, lane or shoulder width, and number of lanes. A deficiency in operating speed indicates the need for road realignment or additional lanes. A deficiency in lane or shoulder width indicates a need to widen the road surface or to provide a shoulder for safety reasons.

Table R2C-2 indicates those links in the network which currently are deficient. In the study area, 38.5 percent are deficient with respect to operating speed, 97.8 percent with respect to lane or shoulder width and 35.6 percent with respect to the existing number of lanes. One-hundred percent of S.R. 45 and S.R. 88 are deficient in lane or shoulder width.

This information indicates that a majority of the major roads in the study area currently require some form of upgrading to meet minimum rural standards. Minor maintenance, such a resurfacing can result in signficant longevity of the road, thereby reducing the need for expensive major reconstruction. Traffic projections will also assist in determining whether minor resurfacing or major reconstruction will be required.

According to the Uintah Basin Transportation Study, the Utah Department of Transportation's State Rehabilitation Program has suggested the following specific highway improvements:

1. U.S. 40 - Vernal to Jensen, 13 miles of existing surface planing and provision of a 3" overlay;
2. U.S. 40 - Twists to Vernal, a 6 mile section of 3" overlay; and
3. U.S. 40 - Jensen to the Utah-Colorado border, a thin coat overlay for 15 miles.

The total estimated costs for these improvements are estimated at $4.8 million dollars.

Existing and past traffic counts have been recorded by the Utah Department of Transportation and the Colorado Department of Highways. This traffic information is usually represented as annual average daily traffic (AADT). Table R2C-3 illustrates the existing and historical traffic volumes for the study area. The percent annual changes between 1979 and 1981, 1977 and 1979, and 1977 and 1981 have also been analyzed. Reductions and decreases in traffic volumes on certain links were reported between 1977 and 1979. This may be explained by high gasoline prices and the statewide reduction of vehicles miles travelled (VMT) during this time period. Between 1979 & 1981, traffic increased on many of the roads in the area. The traffic counts show a 22 percent increase in traffic within Vernal City and along Interstate 70 at this time period. Traffic to the east and west of Vernal along U.S. 40 increased between 5 and 12 percent yearly. Traffic on S.R. 45 also increased 5 percent annually between 1979 & 1981. If this trend continues, there will be traffic safety and congestion problems on the highway network within the Uintah Basin. Most of this growth has been precipitated by oil and gas development in the Basin. Figure R2C-5 shows the 1981 AADT by link.

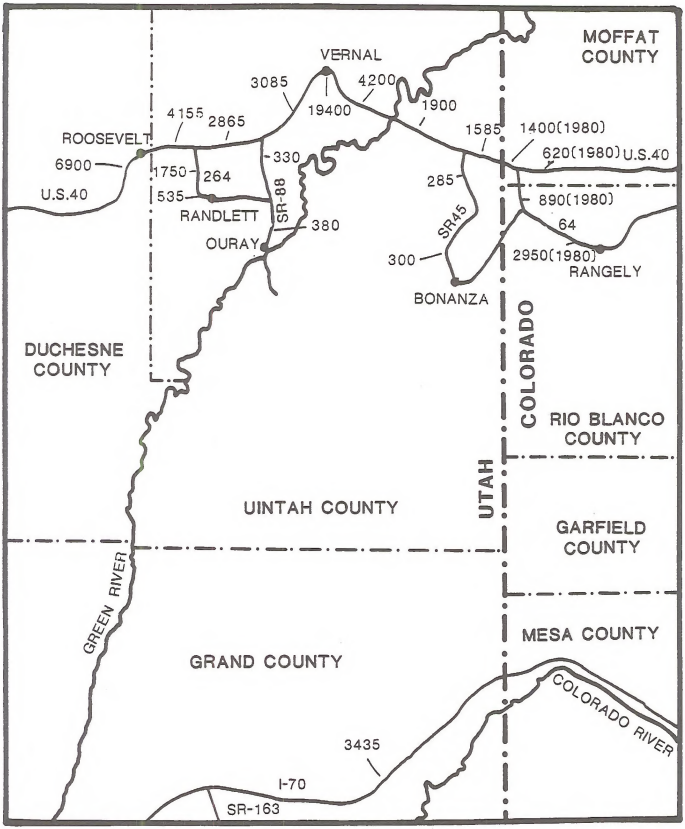
TABLE R2C-3

HISTORICAL TRAFFIC TRENDS
1977 - 1981
ANNUAL AVERAGE DAILY TRAFFIC
(AADT)

Link	YEAR 1977	1979	1981	% ANNUAL CHANGES %1981 1979	%1979 1977	%1981 1977
U.S. 40						
West of Roosevelt to Coline	6,305	6,560	6,900	2.56	2.00	2.28
Co line to 264	3,710	3,940	4,155	2.69	3.05	2.87
264 to SR 88	2,490	2,650	2,865	3.98	3.16	3.57
SR 88 to Vernal	2,640	2,800	3,085	4.97	2.99	3.98
Vernal		13,000	19,400	22.16	--	--
Vernal to Jensen	3,465	3,550	4,200	8.77	1.22	4.99
Jensen to SR 45	1,575	1,500	1,900	12.54	(2.41)	4.80
SR 45 to Utah/Colo.	1,470	1,385	1,585	6.98	(2.93)	1.90
Utah/Colo. to Dinosaur			1,400*	--	--	--
east of Dinosaur			620*	--	--	--
I-70						
SR-163 to Utah/Colo.	2,700	2,295	3,435	22.34	(7.8)	6.20
SR 88						
U.S. 40 to 264	300	325	330	.76	4.08	2.42
264 South	340	375	380	.66	5.02	2.81
SR 45						
North	265	255	285	5.72	(1.90)	1.84
South	280	270	300	5.41	(1.80)	1.74
264						
U.S. 40 to Fort Duschesne	1,500	1,650	1,750	2.99	4.88	3.94
Ft. Duschesne to Randlett	450	500	535	3.44	5.41	4.43
Col. 64						
Dinosaur to Rangely			890-2,950*	--	--	--

*1980 Information
( ) represents a decrease
Source: Traffic on Utah Highways, 1977, 1979 & 1981 - Utah Department of Transportation
Colorado Traffic Volume Study, 1980 - Colorado Department of Highways

FIGURE R2C-5



1981 DAILY TRAFFIC

Two roads outside the study area that serve major recreational areas are S.R. 44 and County Route 149. S.R. 44 is a two-lane, north-south road that links Vernal with FLaming Gorge National Recreation Area. Portions of this road have been widened to three lanes to accommodate passing lanes. County Route 149 connects Dinosaur National Monument with U.S. 40 at Jensen, Utah. This is a two-lane asphalt road of approximately 7 miles. The Ouray National Wildlife Refuge also exists in the study area and can be reached from S.R. 88.

According to the Uintah Basin Transportation Study, most recreational trips were made during the months of May, June, July and August. In 1979, there were approximately 1.7 million people visited Flaming Gorge, and 164,000 visited Dinosaur National Monument. Steinaker Lake Recreation Area, which is north of Vernal along S.R. 44, attracted almost 126,000 visitors in 1979.

Traffic volumes on S.R. 44, between Vernal and Steinaker Lake, reached approximately 3,200 vehicles per day. North of Steinaker Lake, annual average daily traffic diminished to approximately 1,200 vehicles per day. The 1981 estimate for traffic on County Route 149 to Dinosaur National Monument was approximately 500 vehicles per day. This traffic is highly seasonal, evidenced by the monthly variations in traffic shown on Table R2C-4.

Two permanant automatic traffic-recording stations are located in the study area. These stations, located on U.S. 40 are west of Roosevelt and east of Jensen. They record seasonal variations in traffic, and weekday to weekend variations in traffic. Table R2C-4 shows a variation in monthly traffic, with the largest traffic volumes occuring in the summer months. This indicates a propensity for considerable recreational travel in the area. These stations also show the percent average day to average weekday (Monday - Friday) traffic. On U.S. 40 east of Jensen, this ratio was 97.1 percent. This indicates that there is not much variation in traffic between the weekdays and the weekends.

There is a larger variation in monthly traffic east of Jensen than there is west of Roosevelt. This can partially be explained by a higher percentage of recreational trips on this link. A review of many of the principal arterials and interstates in the rural portions of Utah exhibit similar variations in monthly traffic. The largest months appear to be June, July, and August. The lowest months appear to be January and February. U.S. 40 and S.R. 44 will carry the majority of the recreational trips originating in the study area.

TABLE R2C-4

AUTOMATIC TRAFFIC RECORDING STATIONS
1981

	U.S. 40, east of Jensen	U.S. 40, west of Roosevelt
Average daily traffic (Sat-Sun)	1,500	6,558
Average weekday traffic (Mon-Fri)	1,542	6,990
% average day to av. weekday	97.1%	93.8%

% of monthly daily average to yearly daily average	MONTH J	F	M	A	M	J	J	A	S	O	N	D
U.S. 40 east of Jensen	64.7	65.5	71.6	83.6	103.3	129.5	139.5	144.2	124.7	106.3	88.7	78.2
U.S. 40 west of Roosevelt	78.0	83.3	90.8	99.3	104.1	119.6	111.1	111.5	105.7	103.2	99.3	93.4

Source: Traffic on Utah Highways, 1981 - Utah Department of Transportation

Heavy truck traffic plays a significant role in the operation of a road system. The percentage of heavy trucks is a major factor in standard traffic engineering volume-to-capacity and level-of-service analysis. As the percentage of truck traffic increases the capacity of a particular facility is reduced and the level-of-service diminishes. Heavy trucks also contribute to the rapid deterioration of the structural life of a road. Table R2C-2 shows the percent of heavy trucks to AADT. During 1980, truck traffic exceeded 20 percent on U.S. 40, on S.R. 45 and on Interstate 70. This high percentage of heavy truck traffic is attributed to the large number of energy and construction projects in the area.

The Utah State Highway Patrol has established weight limits for heavy trucks. These weight restrictions are: 20,000 pounds per single axle and 34,000 pounds per tandem axle with a maximum load of 80,000 pounds. Any vehicle exceeding this limit would be required to obtain a permit issued by the Highway Patrol. The extent of the weight allowed by permit would be based upon the type of load carried, the number of axles, and the specific road conditions (both structural and geometric) over which the truck would be travelling. Permits are reviewed and issued on an individual case-by-case basis.

The heaviest truck loads, related to the oil shale projects, will be in the transporting of bulky machinery and equipment. Most of this equipment will travel by rail to one of the railheads located in the Salt Lake area, Mack, Colorado or Craig, Colorado. From the railhead, trucks will have to be used to make the remainder of the trip. The energy companies will need to contact the port of entry in the respective states for specific information.

Most of the trucks involved with the oil shale industry would be used in transporting supplies and water to the project site and transporting by-products from the project site. Most of the oil produced will be transported by pipeline. These trucks should be able to conform to the legal weight limits and, therefore, would not require a special permit.

A preliminary analysis of the additional number of truck trips indicates an overall increase in the total number, although the percentage of truck trips to vehicle trips may remain the same. This is due to the large number of additional automobile trips projected. Therefore, a capacity analysis may indicate that the percentage of truck trips would remain at approxmiately 20 percent of all trips. Sufficient detail was not available from some of the energy companies to better estimate the number of truck trips.

Accident statistics were prepared in the Uintah Basin Transportation Study. Table R2C-2 shows the number of accidents per million vehicle miles for each link in the network.

Based on existing traffic volumes and the percentage of heavy truck traffic, a volume-to-capacity (V/C) analysis and a level-of-service (LOS) analysis was conducted. The procedure used was developed for the Highway Capacity Manual. Figure R2C-6 explains the relationship between volume-to-capacity, level-of-service and operating speed. A definition of level-of-service is given in the technical supplement. As figure R2C-6 illustrates, the level-of-service and operating speeds are the greatest at low V/C ratios. As the V/C ratio increases the level-of-service diminishes, and the operating speed is reduced.

Figure R2C-6
LEVEL-OF-SERVICE

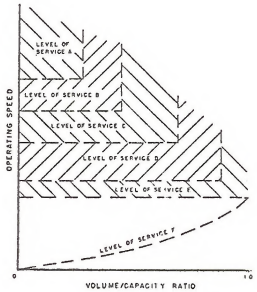
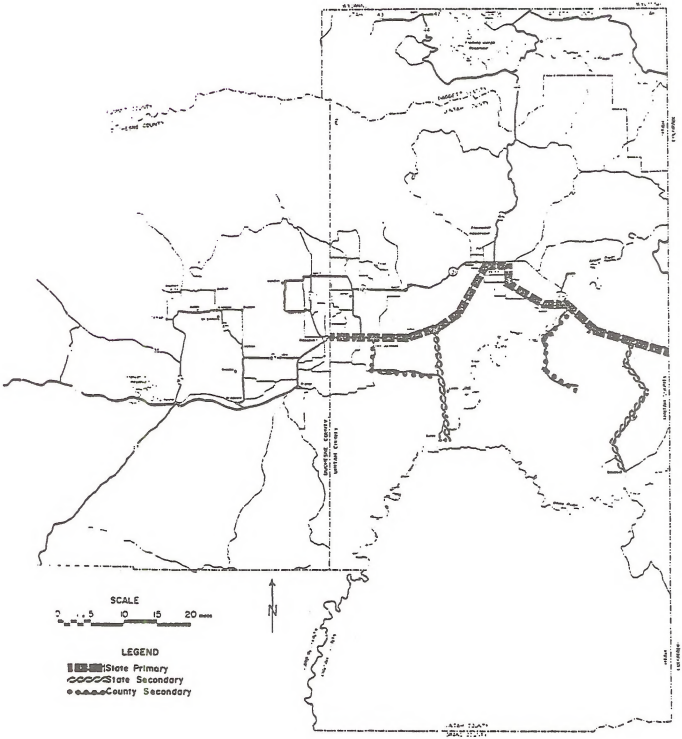


Table R2C-2 shows the V/C ratios and LOS for each link in the system. U.S. 40 operates between a LOS of B & C. Colorado 64 near Rangely is currently operating at a LOS of B. All other facilities are operating at a LOS of A.

Funding for highway improvements in the Uintah Basin may come from a variety of sources. The predominant source is the Federal Highway Trust Fund. To be eligible for these funds, a road must be included as part of the Federal-Aid Highway network. Federal-aid primary (FAP) and federal-aid secondary (FAS) funds are allocated on a formula basis. FAP funds are designated for the construction and improvement of the State's interstate and intrastate highway system. FAS funds are designated for roads which serve as important feeders to the FAP network. Figure R2C-7 shows the routes which are on these two systems in the study area. Local communities can petition to have additional roads placed on the system if certain warrants are met.

Other public sources of funds for highway improvements include the state of Utah (B & C, collector roads) and local revenues. Similar requirements for eligibility apply to these monies. These sources of funds are typically used for maintenance of existing facilities.

FIGURE R2C-7



FEDERAL AID HIGHWAY SYSTEM

Baseline Traffic Projections

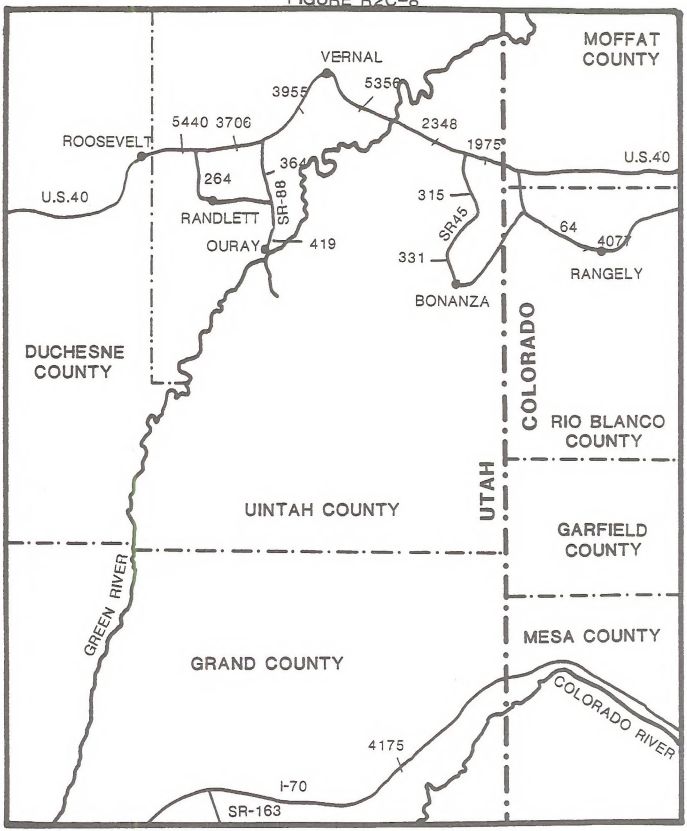
Traffic forecasts were prepared for the major roads within the study area. These estimates are based on the population and number of households projected for the study area, found in earlier sections of this report. The specific process used to predict traffic volumes is explained in the technical supplement in the appendix.

Figures R2C-8, 9, and 10 show the traffic projections by link for the years 1985, 1993, and 1995, and Table R2C-5 lists the traffic estimates for these years and others. Volume is represented by average annual daily traffic (AADT).

The majority of the traffic increases will occur along U.S. 40 and on I-70. This increase will be created by an intercity demand between Vernal and Rangely. Traffic projections decreased between the years 1995 and 2000. This will be a result of a decrease in population and households for the cities of Vernal and Roosevelt between 1995 and 2000.

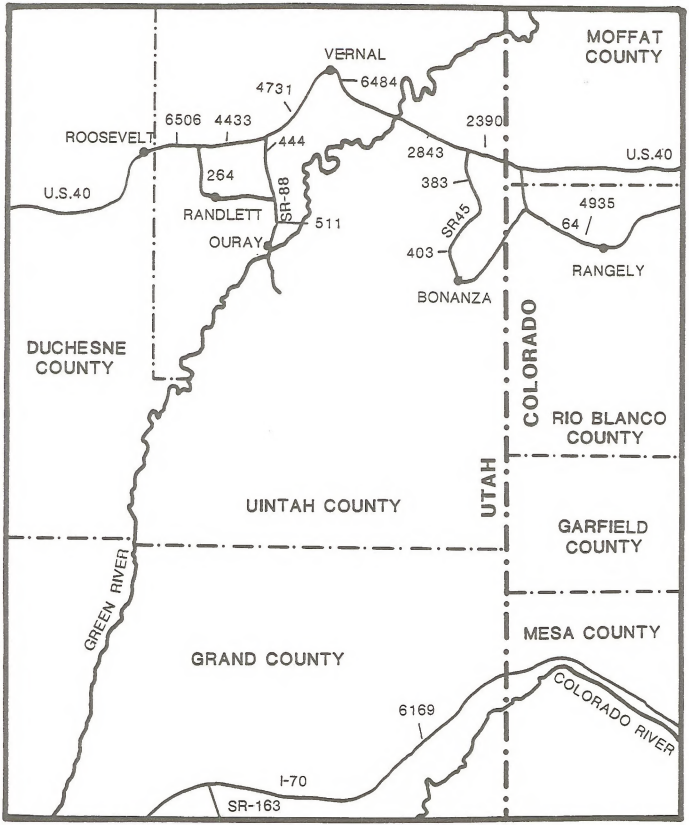
Using the most available truck data and the above traffic projections, a volume-to-capacity and level-of-service (LOS) analysis was performed. Table R2C-6 illustrates that U.S. 40 between the Duschense - Utah County border and County route 264 will be operating at a level-of-service "D" by the year 1985 under the Baseline projection. By 1993, U.S. 40, east of Vernal will also be operating at a LOS of "D". An operating LOS "C" is usually an acceptable level of performance. At a LOS of "D", operating speeds usually diminish and a reduction in safety usually occurs. State routes 45 & 88 are proposed to remain at a LOS of "A" through the year 2000.

FIGURE R2C-8



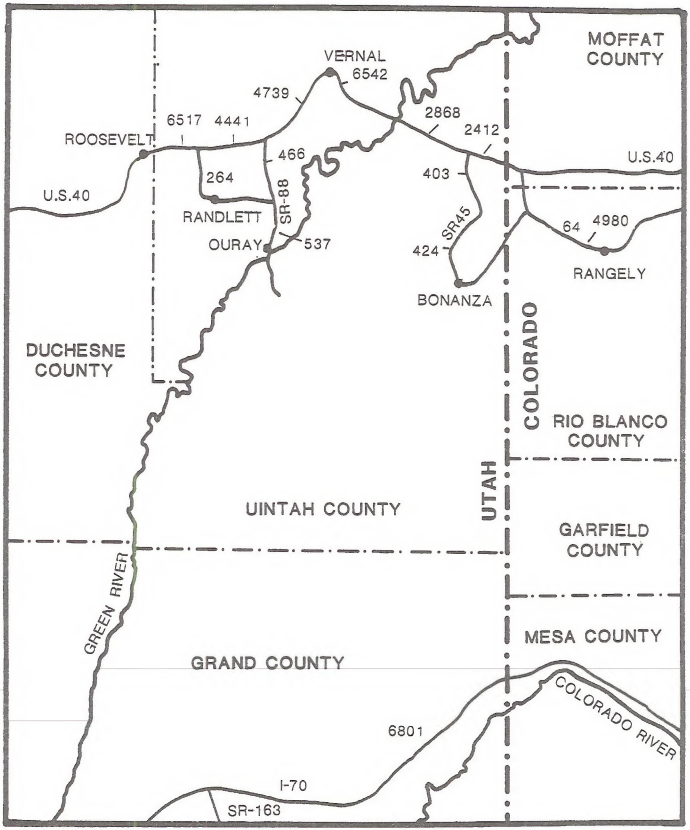
BASELINE TRAFFIC PROJECTIONS
1985
ANNUAL AVERAGE DAILY TRAFFIC

FIGURE R2C-9



BASELINE TRAFFIC PROJECTIONS
1993 ANNUAL AVERAGE DAILY TRAFFIC

FIGURE R2C-10



BASELINE TRAFFIC PROJECTIONS
1995 ANNUAL AVERAGE DAILY TRAFFIC

TABLE R2C-5

BASELINE TRAFFIC PROJECTIONS*

Highway Link	1984	1985	1986	1987	1988	1989	1993	1995	2000
U.S. 40									
Co. Line to 264	5,306	5,440	5,573	5,706	5,839	5,973	6,506	6,517	6,151
264 to 88	3,493	3,706	3,789	3,875	3,963	4,053	4,433	4,441	4,192
88 to Vernal	3,727	3,955	4,045	4,136	4,229	4,326	4,731	4,739	4,473
Vernal to Jensen	5,020	5,356	5,485	5,618	5,754	5,893	6,484	6,542	6,338
Jensen to 45	2,201	2,348	2,405	2,464	2,524	2,586	2,843	2,868	2,778
45 to Utah/Colo	1,866	1,975	2,023	2,071	2,121	2,173	2,390	2,412	2,336
I-70									
SR 163 to Utah/Colo	3,872	4,175	4,383	4,603	4,833	5,075	6,169	6,801	8,680
SR 88									
U.S. 40 to SR 264	356	364	373	382	392	402	444	466	528
SR 264 to Ouray	410	419	429	440	451	462	511	537	607
New Road "C"	--	--	--	--	--	--	--	--	--
SR 45									
Northern	305	315	322	331	339	347	383	403	456
Southern	321	331	339	347	356	365	403	424	480
New Road "D"	--	--	--	--	--	--	--	--	--
Colo. 64									
Dinosaur to Rangely	3,821	4,077	4,175	4,276	4,380	4,486	4,935	4,980	4,825
New Road "A"									
Vernal to SR 45	--	--	--	--	--	--	--	--	--

* These numbers represent average annual daily traffic.

TABLE R2C-6

BASELINE - Volume to Capacity (V/C)
and Level of Service Analysis (LOS)

Highway Link	1985 V/C	1985 LOS	1993 V/C	1993 LOS	1995 V/C	1995 LOS	2000 V/C	2000 LOS
U.S. 40								
Co. Line to 264	.59	C	.71	D	.71	D	.67	D
264 to 88	.40	B	.48	C	.48	C	.46	C
88 to Vernal	.43	C	.51	C	.52	C	.49	C
Vernal to Jensen	.66	C	.80	D	.80	D	.78	D
Jensen to 45	.32	B	.39	B	.40	B	.38	B
45 to Utah/Colo	.27	B	.33	B	.33	B	.32	B
I-70								
SR 163 to Utah/Colo	.11	A	.16	A	.17	A	.22	B
SR 88								
U.S. 40 to SR 264	.06	A	.07	A	.07	A	.08	A
SR 264 to Ouray	.06	A	.08	A	.08	A	.09	A
New Road "C"	--	--	--	--	--	--	--	--
SR 45								
Northern	.05	A	.06	A	.06	A	.07	A
Southern	.05	A	.06	A	.06	A	.07	A
New Road "D"	--	--	--	--	--	--	--	--
Colo. 64								
Dinosaur to Rangely	.44	C	.54	C	.54	C	.53	C
New Road "A"	--	--	--	--	--	--	--	--
Vernal to SR 45								

SECTION R2D

INDIANS

Introduction

The Uintah and Ouray Reservation is located in the Uintah Basin counties of Uintah, Duchesne, Wasatch, and Grand. The reservation is comprised of 1,039,010 acres of tribal lands, and an additional 430,000 acres of land with only mineral and subsurface rights owned by the Ute Tribe. Within the northern part of the reservation, a "checkerboard" pattern of land ownership exists between Indian and non-Indian lands.

In the 1870's, Sam Gilson and Bert Seaboldt (O'Neil & Thompson, 1975) exploited the land for gilsonite, causing this "checkerboard" pattern within the reservation. The developers petitioned Congress, and on May 24, 1878, withdrew 7,000 acres from the original 4,470,914-acre reservation. Subsequently, additional finds of gilsonite were made within the Uncompahgre Reservation, and more lands were removed from Tribal ownership, despite the bitter resistance of the Utes. The federal government allotted some of the land in 1898, but the gilsonite lands were retained until opened to miners in 1903. Those remaining sections under federal control, which were not leased for mineral exploitation, were opened to homesteading in 1905. Much of this land was subsequently occupied by settlers. Additionally, in 1905, President Theodore Roosevelt further reduced the reservation by a 1.1 million acre land withdrawal to create the Uintah National Forest. Finally, another 429,000 acres were removed in 1933 by the Taylor Grazing Act.

Of the available 78,590 acres of irrigated lands, 30,000 acres are used for agriculture. The remaining irrigated lands and an additional 930,000 acres of reservation grazing land, support a total of 4,500 head of cattle. The Tribal Livestock Enterprise owns 2,000 head of cattle.

The Ute Indian Tribe is governed by the Uintah and Ouray Tribal Business Committee which is comprised of six members, two elected from each of the three bands. A Constitution and By-laws approved on January 19, 1937 is the governing document for the Tribe.

Population

The population of the Ute Tribe, according to the Bureau of Indian Affairs, has increased significantly through the last decade: 1,292 (1972), 1,670 (1976), 1,728 (1980) 1,890 (1981). In 1980, 85 percent of the enrolled tribal members lived on or near the reservation. Another 420 Indians, who were either not enrolled in any tribe or who were members of other tribes, were also in residence on the reservation. To be an enrolled Ute requires 5/8 degree of Ute Indian blood. Table R2D-1 delineates the demographic breakdown of the Ute Tribe as of April 1981.

TABLE R2D-1

1981 Ute Indian Demographics

Indians

	Total	Male	Female
Total Resident Indian Population	1,860	912	948
Adjacent to the Reservation	30	14	16
Other Indians, not included in Labor	0	0	0
Total under 16 years of age	718	356	362
Total over 16 years of age	1,172	570	602
16 - 24 years	359	177	182
25 - 34 years	340	168	172
35 - 44 years	208	101	107
45 - 64 years	189	92	97
65 years and over	76	32	44
Total not in labor force (over age 16)	278	126	152
Students (16 years and over)	110	58	52
Men, physically or mentally disabled, retired, institutionalized, etc.	68	68	
Women with no children	100		100
Potential labor force	894	444	450
Employed, total	432	233	199
Employed earning $7,000 or more a year	280	167	113
Employed earning less than $7,000 a year	152	66	86
Not employed	462	211	251
Persons actively seeking work	86	47	39

Source: Bureau of Indian Affairs; R. Coonrod

Employment and Income

The Tribe has an unemployment rate of 52 percent (see Table R2-D1). Virtually all of the 432 employed tribal members work either for the tribe, Bureau of Indian Affairs, or a tribal enterprise. Hence, the Tribe lists fewer than 6 Ute members currently working in the oil and gas industry. Over 65 percent of those employed currently earn less than $7,000 per year.

Housing

A shortage of adequate housing within the reservation leaves 55 families in need of housing. Forty-two dwelling units need to be completely replaced, 50 dwelling units need renovation, and 315 dwelling units are in good repair (Coonrad, R.; 1982). Table R2-D2 delineates the current housing stock.

Since 1964, the Department of Housing and Urban Development (HUD) and the Ute Indian Housing Authority, through formation of the Mutual Help Project (MHP), have made significant improvements in the reservation's housing stock. The MHP completed the construction of 220 ownership units and 70 rental units as September 30, 1981. In addition, the Special Projects Office of the Tribe has renovated and repaired a total of 149 homes, primarily using HUD discretionary grants.

TABLE R2D-2

UINTAH AND OURAY HOUSING INVENTORY

FISCAL YEAR 1981

TRIBE/AGENCY/AREA	Total Number Existing Housing Units	Housing Units in Standard Condition	Housing Units in Substandard Condition	Housing Units Needing Renovation	Housing Units Needing Replacement	Families Needing Housing	Total New Housing Required
Phoenix/U&O Agency:							
Uintah & Ouray Res.	407	315	92	50	42	55	97
Skull Valley Res.	15	8	7	4	3	7	10
TOTAL	422	323	99	54	45	62	107

Education

Currently, the 692 school age members of the tribe attend 8 elementary schools, 1 junior high, and 4 high schools while 50 students attend Bureau boarding schools. Almost 80 percent of the students are enrolled in the three schools, Todd Elementary and West Junior High in Fort Duchesne, and Union High School (currently overcrowded) in Roosevelt. According to standard achievement tests administered by the Uintah School District, Ute students fall substantially behind their non-Indian counterparts in school performance. The Ute students in grades 1-9 average a one year lag behind their counterparts. In the grades above the ninth, the Ute students fall 1.8 grades behind their non-Indian counterparts.

The drop-out rate is high for the Ute students. The 1970 Census data shows the following educational level for tribal members:

Years of School Completed	Percent of Adults
Completed 8th grade	72%
High school graduate	26%
Completion of some college	2%
Median years completed	10th grade

This low percentage of high school completion is further reflected in a four-year drop-out rate of 85 percent for the class of 1978-79; of the 53 students who began the ninth grade in 1974-75, only seven graduated.

Forrest Cuch, who supervises the Indian educational services, cites the education problems as the "most significant social and economic concern" among the tribal members. In the last few years, inroads have been made to improve tribal education through a variety of special education programs:

- o Audlt Basic Education - a high school equivalency program
- o Teaching Training Programs
- o Ute Language and Cultural Maintenance Programs
- o Head Start
- o Johnson O'Malley Program - a supplemental education program for elementary and secondary students

However, the future of these programs is currently in doubt, because of recent federal budget cuts.

Health

The Indian Health Service of the U.S. Department of Public Health and Human Services provides health care to the Ute Indians. A medical clinic at the Duchesne County Hospital in Roosevelt currently serves the Tribe, but a new clinic at Fort Duchesne is under construction and will replace the hospital clinic. The clinic, however, serves only those Utes enrolled, under the Termination Act of 1954.

The Indian Health Clinic (IHC) provides outpatient care, family planning, immunization, pharamacology, and mental health services. As Table R2D-3 delineates, the historical utilization of the IHC has been relatively stable. Don Peters, the administrator of the IHC, cites the inadequate mental health services, particularly lack of an inpatient alcohol detoxification center as the most serious deficiency within Indian Health Services.

Manpower for the IHC is adequate, with 15 full-time staff. The clinic administrator states that the relatively higher wage scale at the IHC has assisted their recruitment efforts. Dental services for the Utes are provided at Fort Duchesne by the U.S. Department of Public Health, and the new clinic should provide adequate health care coverage under baseline growth assumption.

TABLE R2D-3

INDIAN HEALTH SERVICE CALENDAR YEAR VISITS (1974-1980)

	1974	1977	1978	1979	1980
First visit	6,630	7,022	6,514	6,676	8,100
Revisit	6,115	5,809	6,233	4,432	4,567
Family Planning	182	176	134	127	96
Immunization	551	450	445	510	333
Other	330	222	474	530	376
TOTAL	13,808	13,679	13,890	12,275	13,472

Source: An Assessment of the Impact of Oil Shale and Tar Sands Development on the Health Care System of the Uintah Basin; John Short and Associates, 11-81

Law Enforcement

The Tribe has 14 police officers and 13 supplemental enforcement staff on the reservation. The Law and Order Division cites an average of 1,500 arrests, 7,000 law enforcement complaints investigated, and 8,000 non-enforcement calls responded to per year. In addition, 6,000 prisoner days in detention facilities per year are also recorded.

Fire

The Tribe contracts with Roosevelt for fire protection services, although the Bureau of Indian Affairs, Forestry Division, provides some volunteer assistance.

Parks and Recreation

The Tribe runs the Bottle Hollow Resort at the Fort Duchesne, the resort has: 123 units, a convention center, coffee shop, dining room, private club, museum, gift shop, grocery store, swimming pool, campground, and marina. The reservation area provides: fishing, hiking, water skiing, boating, hunting, backpacking and river trips. The Ute Reservation's Fish and Wildlife Industry administers the tribal recreation facilities, which provide considerable revenue to the Tribe. In addition, the tribe runs the Ute Lanes Bowling Alley, a 12-lane facility at Fort Duchesne.

Sewer

The Indian Health Service has installed a sewer system for basic sanitary needs on the reservation.

Water

The Ute Tribe holds four water rights, three on Willow Creek in Uintah County and one on Florence Creek in Grand County. The 60-acre Willow Creek and the 80-acre Florence Creek provide 12 cubic feet per second. The "Winters Doctrine" of 1908 grants Native Americans the "beneficial use", for agricultural purposes, of all waters which run across or border the reservation. Under the "Winters Doctrine", the 23 percent of water from the Colorado River Compact designated for use in Utah contains an unspecified amount of water for the Utes.

In addition, the Tribe currently leases water to 220 connections in the community of Ballard.

Transportation

Major transportation links, which include U.S. 40, S.R. 88, and County Route 264, cross the Indian reservation. U.S. 40 is considered a primary artery and carries a large portion of traffic that begins and ends outside the study area. U.S. 40 also serves as a major link between Roosevelt, Vernal, and Craig, Colorado. S.R. 88 is a north-south road extending north from Ouray and intersecting U.S. 40. County Route 264 extends south from U.S. 40, through Fort Duchesne, and east through Randlett to S.R. 88. Existing traffic on this facility is low, especially south of Fort Duchesne.

An inventory of existing structural conditions on U.S. 40 and S.R. 88 has indicated the need for some reconditioning. An on-site inspection of County Route 264 showed a variation in surface conditions; the surface structure of the roadway between Fort Duchesne and Randlett is poor.

The several paved, semi-paved, and dirt roads in the area will not be able to support substantial increases in traffic because of poor structural conditions and low operating speeds.

Most of the increased traffic from the energy projects (mainly Tosco, Geokinetics, and Magic Circle) would use S.R. 88 as access to Vernal. Cumulative projected traffic on S.R. 88 between U.S. 40 and Ouray (high scenario plus interrelated projects) is approximately 6,800 vehicles per day in 1995. Existing traffic is 400 vehicles per day.

CHAPTER R3

ENVIRONMENTAL CONSEQUENCES

LOW LEVEL DEVELOPMENT SCENARIO

The Low Level Development Scenario represents a partial development of all seven projects being examined. Total oil production under this scenario will be 123,000 barrels, or 40 percent of that planned under full production. This scenario may represent a realistic alternative to what might happen for some projects in terms of economic feasiblity. However, for interrelated projects, this may not represent a realistic alternative. Nonetheless, a scenario which examines the future at some level other than full production is extremely important for planning purposes. Few people have confidence in the ability of all projects to develop to their full capacity.

The discussion here will be organized as follows: first the work force assumptions will be discussed, next, the total impacts of the Low Level Development Scenario will be discussed. This will be followed by a discussion of the county level impacts for Uintah, Duchesne, Rio Blanco and Moffat Counties (no significant impact occurs in the other counties in the Low Scenario). The next level of discussion will be the census county division, which is the primary unit used for allocation purposes. Following, will be a discussion of the allocation of the impacts down to the community level for the four impacted communities in Utah--Roosevelt, Myton, Ballard and Vernal and the two Colorado communities of Dinosaur and Rangely.

Work Force Assumptions

The work force assumptions are critical in the process of projecting impacts. The State Planning Coordinator's Office worked closely with representatives of the companies in finalizing the employment assumptions. Table R3A-1 summarizes the direct construction and operation phase employment assumptions for each of the seven EIS projects included in the Low Level Scenario. It should be noted, with the exception of the Enercor-Mono Power project and the SOHIO Tar Sands project, each project is identified as having a construction camp and a construction non-camp component. All of the

TABLE R3A-1

DIRECT EMPLOYMENT ASSUMPTIONS*
LOW-LEVEL SCENARIO

PROJECT	BARRELS OF OIL	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
GEOKINETICS																
(Lofreco)	20,000															
Const.-camp		0	0	0	10	20	40	50	60	70	80	100	110	120	120	120
Const.-noncamp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations		0	0	0	90	180	260	350	440	530	620	700	790	880	880	880
(Agency Draw)	11,000															
Const.-camp		0	0	0	65	175	140	0	0	40	20	0	0	0	0	0
Const.-noncamp		0	0	0	235	625	510	0	0	160	55	0	0	0	0	0
Operations		0	0	0	0	200	200	400	400	400	450	450	450	450	450	450
SYNTANA-UTAH	16,500															
Const.-camp		0	0	160	630	1,000	40	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	80	320	525	25	0	0	0	0	0	0	0	0	0
Operations		0	0	0	0	205	660	780	780	780	780	780	780	780	780	780
EMERCON-MONOPOWER																
(P.R. Springs)	15,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	215	1,635	1,450	1,370	0	0	0	0	0	0	0	0
Operations		0	0	0	0	0	80	150	450	450	450	450	450	450	450	450
(Rainbow)	5,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	130	200	200	75	0	0	0	0	0	0	0	0	0	0
Operations		0	0	60	120	275	275	275	275	275	275	275	275	275	275	275
PARAMO	10,500															
Const.-camp		0	0	650	1,085	260	40	60	0	0	0	0	0	0	0	0
Const.-noncamp		0	100	200	345	80	10	40	0	0	0	0	0	0	0	0
Operations		0	0	0	100	475	650	350	0	0	0	0	0	0	0	0
TOSCO	22,000															
Const.-camp		0	0	60	260	880	1,200	640	80	40	0	0	0	0	0	0
Const.-noncamp		0	0	100	425	1,465	1,985	1,065	135	65	0	0	0	0	0	0
Operations		0	0	70	245	380	490	960	1,455	1,520	1,520	1,520	1,520	1,520	1,520	1,520
SOHIO	5,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	0	0	0	110	375	75	0	0	0	0	0	0
Operations		0	0	0	0	0	0	0	0	100	175	175	175	175	175	175
MAGIC CIRCLE	16,400															
Const.-camp		0	350	650	520	500	500	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	30	35	30	20	20	0	0	0	0	0	0	0	0	0
Operations		0	60	170	390	690	1,200	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350	1,350
UINTAH BASIN TOTAL	168,400															
Const.-camp		0	350	1,520	2,570	2,835	1,960	750	140	150	100	100	110	120	120	120
Const.-noncamp		0	260	615	1,555	2,790	2,550	2,585	510	300	55	0	0	0	0	0
Operations		0	60	250	945	2,405	3,735	4,465	4,700	4,955	5,170	5,250	5,340	5,430	5,430	5,430
SOUTHEAST MCO TOTAL	15,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	215	1,635	1,450	1,370	0	0	0	0	0	0	0	0
Operations		0	0	0	0	0	80	150	450	450	450	450	450	450	450	450
GRAND TOTAL	123,400															
Const.-camp		0	350	1,520	2,570	2,835	1,960	750	140	150	100	100	110	120	120	120
Const.-noncamp		0	260	615	1,770	4,425	4,000	2,585	510	300	55	0	0	0	0	0
Operations		0	60	250	945	2,405	3,815	4,615	5,150	5,405	5,620	5,700	5,790	5,880	5,880	5,880
TOTAL EMPLOYMENT		0	670	2,385	5,285	9,665	9,775	7,950	5,800	5,855	5,775	5,800	5,900	6,000	6,000	6,000

construction camps will be located on site in the "Bonanza" Census County Division.[1] The workers residing in that camp should not bring families into the Uintah Basin area, and should exert only minimal demands on public and private goods and service provision capacities in the area. The sectors of the economy where demands will be increased include retail trade, police protection, some personal services, and service stations. No impact is anticipated in sectors such as furniture, real estate, education.

The remainder of the construction workers (non-camp) are assumed to behave similarly to major project construction workers, in terms of both household size (dependency ratio) and geographic dispersion of residences.[2] However, the "non-camp" construction workers living in communities exert less demand on public and private goods and services than do permanent operations workers for two reasons: first, because of their more temporary nature; and second, because they have a higher propensity to be either single, unaccompanied by families or to have smaller families.

Under the Low Scenario, total construction employment for the seven projects peaks in the year 1985 at 7,260 workers; therefore, much of the analysis will be centered on this date (both construction and operation). However, total employment (both construction and operations) peaks in the year 1986 at 9,775 employees. The year 1993 represents the point at which all projects have reached full production and have reached stable permanant operations work force. Therefore, much of this analysis will be focused on that year as well.

Following is a discussion of the critical work force assumptions on a project by project basis:

Geokinetics:

The Geokinetics Oil Shale operation is currently in the demonstration phase. The company's intention is to develop two separate projects; the LOFRECO project, an underground in-situ retorting process; and the Agency Draw project, a mining and above ground retorting process. Under the Low Scenario, the LOFRECO project is anticipated to produce 20,000 barrels of oil from shale. Because of the nature of the process, no construction

[1] The "Bonanza CCD" does not correspond to the 1980 Census defined CCD's in Uintah County. It is defined for purposes of this study; it includes the Bonanza area and covers most of the Uintah and Ouray CCD with the exception of the western portion containing Ballard.

[2] Mountain West Research, Inc., Construction Worker Profile, Old West Regional Commission, Billings, Montana, 1975.

phase is needed; instead, the same work force is utilized for development of the retort sites and the actual production of oil. Therefore, the workers are more permanent in nature and have characterstics more like operations workers. However, in Table IV.1 there are workers listed as "const-camp". Although not truly construction workers, these people will live on-site (probably in mobile homes) and thus will exert impacts more like construction workers living in a work camp. The Agency Draw part of the Geokinetics project is an above ground retorting process more like the interrelated projects anticipated in the area and will have a more characteristic construction cycle, peaking at 800 in 1985. Full operations will produce 11,000 barrels of oil from shale and will employ 450 people under the Low Scenario. A small portion of the work force will be housed in a work camp. Work force assumptions were developed from telephone conversations with Rusty Lundberg of Geokinetics.

Syntana-Utah:

Under the Low Scenario, Syntana will produce 16,500 barrels of oil from shale. Construction will peak at 1,525 people in 1985 with a large portion (approximately 2/3) housed in a construction camp. Work force numbers were provided by BLM and were verified by Ed Maholick of Sytana-Utah.

EnerCor--Mono Power:

This project consists of two major components; the Rainbow project and the P.R. Springs project. The Rainbow project is a smaller pilot project located in southern Uintah County and will impact mainly the Uintah Basin. No construction camp is planned for the Rainbow project. The construction work force will peak in 1983-84 at 200. However, the operations work force by 1985 will be even larger. The P.R. Springs portion of the project is located near the Uintah/Grand County line. P.R. Springs represents the commercial phase of the EnerCor project and will employ 1,635 construction workers during the peak of construction and 450 during operations under the Low Scenario. No work camp is now being planned for the project, but a new town is being considered at Westwater, along the Colorado River. However, according to Jim Webster, consultant for the project, no new town would be planned under the Low Scenario. Jim Webster and Mike San Miguel of EnerCor were both helpful in providing data on the Enercor project.

PARAHO:

The Paraho project is anticipated to be one of the first to be developed, starting construction in the latter part of 1982. The peak of the construction work force in 1984 is at 1,430 workers with a large portion of the work force (approximately 75 percent) housed in construction camps. It should be noted that under a Low Scenario, the Paraho project has indicated that it would not continue operations past 1987. Paraho plans to build a 10,500 barrel test facility to be completed and in full operation by 1986. If this test facility is found to be successful, they would move into full operation defined under the High Scenario. If it is not successful, they will

discontinue operations of this test module, assuming that it would not be economically viable to continue operation at this low production level. Paraho interprets the Low Scenario as a situation where the test module is developed, not moved into commercial development but instead, shut down in 1987. Final work force assumptions for the Paraho project, including the size of the construction camp, were obtained from a letter dated January 22, 1982, from Bill Erwin of the Paraho project. Bill Erwin, R.N. Heistand, and Debra O'Connor of Paraho and Joan Kelly of VTN have been most helpful in providing information on the Paraho project.

TOSCO:

The TOSCO project at Sand Wash is assumed to produce 22,000 barrels of oil from shale under the Low Scenario and to employ 3,185 construction workers at the peak (1986) and 1,520 people at full operations. A construction camp is planned to house approximately 40 percent of the work force. This project represents the largest production level as well as the largest work force of any of the seven projects. It should be noted that TOSCO does not consider the "Low Scenario" rationale appropriate as applied by BLM to the Sand Wash Project. They state, "The use of the lower work force numbers suggests that the project can be economical at something less than the planned full scale operation". Final work force numbers, including the size of the construction camp, were obtained from a letter dated January 28, 1982, from John E. Hardaway of TOSCO Corp.

SOHIO:

SOHIO, under the Low Scenario, will be relatively small, producing 5,000 barrels of oil from tar sands on Asphalt Ridge near Vernal. The project will employ only 375 people at the peak during 1988, and 175 during operations in 1990. No construction camp is planned for SOHIO because of its proximity to Vernal. Work force assumptions for the project were provided by Bob Dudiak of SOHIO Oil.

Magic Circle:

The Magic Circle project is anticipated to produce slightly over 16,000 barrels of oil from shale, and to employ 685 construction workers during the peak, and 1,350 operation workers during full operation. A large portion (95 percent during the peak) of construction is anticipated to be housed at a construction camp located on-site. Reed Clayson of Magic Circle is helpful in producing work force data for the Magic Circle project.

The Regional Level Analysis

One major assumption has been made in carrying out the areawide regional analysis of both the Low and High Development Scenarios. This assumption is that as a result of the substantial increases in the region's population, the area will undergo a significant change in its industrial structure. In particular, in most industrial sectors, a process of import substitution will occur such that a larger proportion of demand for goods and services by residents of the regions will be met by workers whose jobs are in the Basin rather than elsewhere. The result of this assumption is the unusually high employment multiplier exhibited in the projections presented below. It must be emphasized that further increases in basic employment, such as those associated with further synfuel developments, would not be expected to have such a high multiplier since the Low and High Scenarios already assume this import substitution effect. Only further expansion on the order of a doubling of total region's basic employment in the High Development Scenario (including Baseline basic employment) could be expected to produce another round of import substitution and thus duplicate the multiplier implicit in the projections presented here.

The assumptions described above were combined with continued historically determined assumptions regarding such parameters as fertility and survival rates, migration propensities for permanent operations phase in-migrants; labor force participation in conditions of high prosperity, and household formation, etc., to produce the projection of impacts of the Low Development Scenario summarized in Tables R3A-2 and R3A-3.

* The employment multiplier is the ratio of total jobs to basic employment jobs.

TABLE R3A-2

TOTAL REGIONAL IMPACTS
Low Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Total	Employment Basic	Households Impact	Labor Force Impacts	School-Age Population (5-17) Impacts
1982	1,224	799	670	286	785	182
1983	4,030	2,763	2,385	781	2,727	527
1984	10,285	6,473	5,285	2,522	6,368	1,559
1985	22,080	12,694	9,665	6,532	12,416	3,796
1986	24,268	13,357	9,775	7,546	12,998	4,419
1987	22,072	11,459	6,580	7,087	11,134	4,196
1988	18,349	8,925	5,800	5,786	8,730	3,460
1989	19,380	9,215	5,855	6,018	9,025	3,622
1990	20,095	9,348	4,774	6,160	9,137	3,820
1991	21,249	9,683	5,800	6,423	9,434	4,291
1992	22,823	10,180	5,900	6,789	9,935	5,026
1993	24,593	10,730	6,000	7,195	10,508	5,899
1994	25,975	11,116	6,000	7,502	10,893	6,709
1995	27,130	11,459	6,000	7,758	11,220	7,447
1996	28,203	11,784	6,000	8,001	11,540	8,142
1997	29,187	12,086	6,000	8,230	11,842	8,770
1998	30,040	12,357	6,000	8,432	12,106	9,309
1999	30,797	12,603	6,000	8,621	12,349	9,764
2000	31,397	12,810	6,000	8,786	12,544	10,117

* These represent impacts in all seven counties of the studay area including Uintah, Duchesne, Daggett, Grand, Rio Blanco, Moffat, and Mesa Counties. However, the impacts were significant only in 5 of the 7 counties. For the Counties of Daggett and Mesa, the impacts were not significant and no further analysis for these counties is included. The county impacts provided in the tables which follow do not sum to the regional total since Daggett and Mesa Counties are not included.

TABLE R3A-3
TOTAL REGIONAL IMPACTS
Low Level Development Scenario
Employment Impacts By Industry

Industry	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mining (Including Synfuels)	60	251	957	2,429	3,860	4,669	5,213	5,477	5,702	5,801	5,900	6,000	5,999	5,998	5,995
Contract Construction	618	2,158	4,405	7,444	6,163	3,533	819	639	363	324	367	413	455	494	657
Manufacturing	2	7	22	56	65	64	57	61	65	70	77	84	90	95	115
Trans., Commun., & Utilities	6	17	53	133	157	153	136	145	153	164	178	194	207	218	263
Trade	35	104	322	810	951	927	825	883	932	999	1,084	1,179	1,258	1,326	1,589
Finance, Ins., & Real Estate	4	13	41	104	123	122	112	120	128	138	151	165	177	188	231
Services	22	65	204	521	617	606	543	585	622	674	732	801	858	908	1,105
Government	40	114	362	914	1,085	1,051	918	970	1,019	1,109	1,242	1,397	1,530	1,649	2,116
Non-Farm Prop.	12	35	109	283	335	334	303	334	365	403	449	498	542	582	739
TOTAL	799	2,763	6,473	12,694	13,357	11,459	8,925	9,215	9,348	9,683	10,180	10,730	11,116	11,459	12,810

Comparative Analysis

In addition to the output of population and employment impacts, Table R3A-2 presents the derived output: households, labor force, and school-age population. These output must be derived since the model does not handle explicit assumptions of, for example, average household age. The model does require an assumption reflecting the propensity to be a head of household by age and sex. The total number of head of households represents the total number of households. This approach generates a total household number that is responsive to changes in the age structure of the population. The migration rate assumption performs in a similar manner; age and sex migration propensities are used. This relationship replaces the need for an explicit assumption about the family characteristics of in-migration for employment. The labor force is determined by applying age and sex specific labor force participation rates to the population. Since the population projections must include these characteristics in order to apply the labor force participation rates, it is beyond the ability of the model to provide labor force projections at the county level.

The tremendous increase in permanent Uintah Basin population compared to the baseline case will be, even under the Low Scenario, the most significant aspect of the regional analysis. The year 2000 total Low Scenario population impact will be 31,000. A second major characteristic of the population impact will be its tracing out a boom-bust path as the projects complete their construction phases in the late 1980's - early 1990's and move into their lower direct employment operations phases. The peak population impact year during the construction phase, 1985, which introduces over 24,000 people in the area is an addition to the baseline; the impact drops to 18,000 by 1988. This boom-bust path would be marked by an even higher peak if it were not for the bachelor construction camps, which are to house between 30 and 80 percent of the construction workers. If these camps are not built as planned, the impact will be significantly higher than stated here.

After the operation phase is in full production (1993), the impact will grow to 24,600, and by the end of the century the population impact will increase to approximately 31,000 people. The average household size during full operations will be about 3.5 persons per household. The magnitude of the impact, derived from the basic employment impact of 6,000, will result from

the assumption stressed above: that the Uintah Basin will undergo a structural transformation if the Low (or High) Development Scenario meets a larger proportion of its residents' demands for goods and services through local production if baseline conditions hold. The employment columns of Table R3A-2 show the impact employment multiplier (total employment impacts divided by basic employment impact) is 2.14. This figure is unusually high for a sparse economy such as that of the Uintah Basin, and can be expected to occur only if the assumed import substitution transformation is realized. It must be emphasized again, that use of the 2.14 multiplier for projection of the impacts of small projects, in addition to either the baseline proportion or the Low Development or High Development Scenario, is entirely inappropriate and will result in a gross overstatement of such impacts.

One of the most important problems indicated by the Low Scenario impact is its implication for the areas' public education systems. School age population impacts increase rapidly to a peak in 1985, decline slightly in 1988, and then surge again, as permanent in-migrants' children reach the education ages. Consequently, by the year 2000, there will be over 10,000 additional school-age children. This illustrates an important difference between the impact projections and the baseline projections. The heavy in-migration occurring during most of the period in the Low Scenario results in a population which is substantially younger than that of the baseline population. Other implications of this difference relate to the quantity and type of health care requirements. Older populations require more health care per capita, and elderly care is more costly than that required by younger populations. Different types of income maintenance programs are also required. Computer print-outs of the projections summarized in this report, which present extensive detail to support specific planning needs, will be provided as needed.

County Level Projections

In Duchesne County the impact during 1985 (peak year of construction employment) will be approximately 3,800 people or an increase of 21 percent over the baseline projection (Table R3A-4). During 1993, after full operations occur, the impact will be 5,800, or a 31 percent increase over the baseline. By the year 2000 the impact will have grown to 7,700 or a 42

percent increase. In Duchesne the largest employment impacts will be in trade, service and government sectors (all synfuel employment will be in Uintah County). (Table R3A-5).

In Uintah County the impact during 1985 will be 13,100 a 51 percent increase over the baseline (Table R3A-6). During 1993, the impact will reach approximately 16,000, a 54 percent increase, and by the year 2000 the impact will be 20,600 a 71 percent increase over the baseline. Not surprisingly then, the most significant impact of the Low Scenario will occur in Uintah County. The mining sector (including synfuel) and construction sectors will be the most heavily impacted, but significant impacts also will occur in trade, services, and government (Table R3A-7). In Colorado the population impact will be considerably smaller: 900 in 1985, 800 in 1993 and 1,100 in the year 2000. These will represent 4, 3, and 4 percent increases respectively. The impacts for Colorado represent the projected impacts for the two communities of Rangely and Dinosaur. At the county level, the impacts will not be significant; however, the combined impact projections are provided for purposes of comparison. (Table R3A-8 and R3A-9). The most significantly impacted sectors again will be trade, services and government.

TABLE R3A-4

DUCHESNE COUNTY
Low Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Basic	Households Impact	School-Age Population (5-17) Impacts
1982	208	31	0	69	44
1983	596	88	0	186	126
1984	1,786	271	0	595	362
1985	3,768	586	0	1,299	744
1986	4,624	735	0	1,541	916
1987	4,256	702	0	1,419	838
1988	4,011	687	0	1,294	762
1989	4,500	781	0	1,406	848
1990	4,644	833	0	1,451	887
1991	4,933	916	0	1,495	1,001
1992	5,350	1,024	0	1,621	1,184
1993	5,826	1,148	0	1,714	1,405
1994	6,191	1,254	0	1,821	1,607
1995	6,501	1,349	0	1,857	1,793
1996	6,792	1,441	0	1,941	1,970
1997	7,061	1,526	0	2,017	2,130
1998	7,303	1,604	0	2,087	2,288
1999	7,518	1,675	0	2,088	2,393
2000	7,686	1,735	0	2,135	2,486

TABLE R3A-5

DUCHESNE COUNTY
Low Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	0	0	0	0	0
Contract Construction	37	67	99	120	164
Manufacturing	17	28	40	48	63
Transp., Comm., & Utilities	23	32	42	49	61
Wholesale & Retail Trade	168	224	290	330	403
Finance, Insurance & Real Estate	22	30	40	46	58
Services	84	130	181	214	276
Government	181	234	331	396	520
Non-Farm Proprietors	55	88	123	146	190
Total	586	833	1,149	1,349	1,736

TABLE R3A-6

UINTAH COUNTY
Low Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Population in Communities*	Employment Impact Total	Employment Impact Basic	Households Impact	School-Age Population (5-17) Impacts
1982	960	602	761	670	201	127
1983	3,267	1,730	2,654	2,385	541	366
1984	7,505	4,908	5,847	5,070	1,636	995
1985	13,100	10,242	9,691	8,030	3,532	2,023
1986	14,630	12,656	10,332	8,245	4,219	2,508
1987	12,831	12,077	8,465	6,430	4,026	2,377
1988	12,075	11,931	7,393	5,350	3,849	2,268
1989	12,511	12,357	7,570	5,405	3,862	2,328
1990	13,087	12,984	7,650	5,325	4,058	2,481
1991	13,809	13,706	7,874	5,350	4,153	2,781
1992	14,856	14,743	8,238	5,450	4,468	3,263
1993	16,043	15,920	8,641	5,550	4,682	3,838
1994	16,971	16,848	8,897	5,550	4,955	4,372
1995	17,735	17,612	9,126	5,550	5,032	4,857
1996	18,450	18,326	9,342	5,550	5,236	5,315
1997	19,100	18,977	9,541	5,550	5,422	5,725
1998	19,681	19,558	9,723	5,550	5,588	6,128
1999	20,196	20,072	9,888	5,500	5,576	6,389
2000	20,581	20,457	10,024	5,550	5,683	6,618

*The difference between the population living in communities and total population impact are those people living in the work camps.

TABLE R3A-7

UINTAH COUNTY
Low Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	2,427	5,521	5,550	5,550	5,550
Contract Construction	5,710	260	269	325	437
Manufacturing	25	31	37	40	47
Transp., Comm., & Utilities	77	104	131	147	177
Wholesale & Retail Trade	435	599	763	862	1,040
Finance, Insurance & Real Estate	55	80	104	119	147
Services	305	420	534	601	723
Government	510	672	930	1,101	1,418
Non-Farm Proprietors	145	233	322	380	486
Total	9,691	7,650	8,641	9,126	10,024

TABLE R3A-8

COLORADO (Rio Blanco-Moffat Counties)
Low Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Employment Impact Basic	Households Impact	School-Age Population (5-17) Impacts
1981	0	0	0	0	0
1982	61	8	0	20	13
1983	164	20	0	51	35
1984	418	53	0	139	85
1985	810	106	0	279	160
1986	931	126	0	310	185
1987	780	109	0	260	149
1988	635	94	0	205	121
1989	684	102	0	214	129
1990	705	109	0	220	135
1991	739	118	0	224	150
1992	790	131	0	239	175
1993	848	146	0	249	204
1994	895	158	0	263	232
1995	934	169	0	267	258
1996	970	180	0	277	281
1997	1,003	190	0	287	303
1998	1,032	199	0	295	323
1999	1,058	207	0	294	337
2000	1,078	214	0	299	349

TABLE R3A-9

COLORADO (Rio Blanco, Moffat Counties)
Low Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	0	0	0	0	0
Contract Construction	7	10	14	17	23
Manufacturing	0	0	0	0	0
Transp., Comm., & Utilities	5	5	6	7	8
Wholesale & Retail Trade	29	27	35	39	47
Finance, Insurance & Real Estate	4	4	5	6	7
Services	16	18	25	29	37
Government	34	31	43	51	65
Non-Farm Proprietors	11	13	17	20	26
Total	106	109	146	169	214

The CCD-Level Impacts of the Low Development Scenario

The census county division is the primary geographic used by the Spatial Allocation Model (SAM) to make allocations of the areawide unit projections. The allocation of the regional impacts among the consitutuent CCD's depends upon three sets of assumptions: (1) the locations of the projects's direct basic employment, (2) commuting patterns among the work force holding those jobs, and (3) the shopping-trade patterns which serve to locate the residentiary jobs in the various communities. There appears to be no reason to expect a modificaton of trade patterns of the central place hierarchy among CCD's which underlies the SAM calibration of the baseline. Even though, as emphasized in the previous subsection, more total residential employment per capita is expected in the Low and High Development Scenarios; no change in relative service provision capacities among the CCD's is assumed.

The commutation assumptions for the oil shale projects, on a project specific basis, were adapted from work done by the Uintah Basin Association of Governments, the Utah State Department of Community and Economic Development, and their consultants, APA Planning and Research of Salt Lake City, Utah. The assumptions were derived using a gravity model, which in turn is adapted from the Burns and McDonnell Socio-economic Environmental Assessment for the Proposed Deseret Generation and Transmission Cooperative Moon Lake Project (1979). This gravity model is discussed in detail in the final section of the report. An important assumption included in the application of the gravity involves the distance used from the projects to the surrounding communities. Local planners felt that the distance from Bonanza to Rangely via the route along the White River, should not be used in the gravity model. This is because the route capacity is insufficient to accomodate heavy levels of traffic, and county officials have indicated they will not maintain this route for use by commuter traffic. Also, construction workers now working at the Bonanza Power Plant are not now using this route to commute to Rangely. In fact, currently, out of 800 construction workers at the plant, none are commuting from Rangely. Therefore, it is determined that the true impedance from Rangely to Bonanza should be measured via state route 45 and U.S. route 40. Table R3A-10 presents the projects specific commuting proportions used in this study. Individual projects' proportions remain constant throughout the projection period, but total proportions commuting to each area vary somewhat year by year as the different projects pass through their construction phases and into full operations.

Table R3A-10 notes out a crucial aspect of the prospective Bonanza area energy impacts. While Bonanza CCD will be the location of all energy jobs in the Low Development Scenario (and most energy jobs in the High Scenario), the plans and expectations of the local officials (and of the energy companies themselves) are that the workers will live in existing communities. Only if some version of a new town proposal is implemented will the Bonanza area participate in the general economic boom expected from the synfuel energy industry expansion.

The assumptions about the parameters controlling Low Development Scenario impact allocation discussed above were incorporated into SAM data files to project the geographic distribution of those impacts. The resultant allocations are summarized in Table R3A-11.

A number of important inferences can be drawn from the summaries appearing in Table R3A-11. The most significant of these is the likelihood that the bulk of the total Low Scenario impact (50 percent in 1993) will be centered in the Vernal CCD. This will reflect the combined effects of the large percent of Bonanza CCD energy projects' workers living in Vernal, and Vernal's continuation as the highest order trade center in the Uintah Basin. The permanent impacts on the Roosevelt and Uintah-Ouray CCD's also will be significant. The Vernal CCD impact will be, however, the largest in both absolute and relative terms.

The Community Level Impacts of the Low Development Scenario

Further allocations of the CCD level projections were accomplished, not by the SAM model, but by consultation with local planners and officials. These people have a much better understanding of the ability of existing communities to absorb growth and to provide the necessary services. Additionally, allocations to the community level were based on both existing boundaries and planned additions to the cities where such plans existed.

After examination of the CCD level projections, a determination is made that four existing incorporated communities in Utah would be significantly impacted by the EIS projects. These communities include Vernal, located in Uintah county; in the Vernal CCD, Ballard, located in Uintah county in the Uintah Ouray CCD; and Roosevelt and Myton, both located in Duchesne County and in the Roosevelt CCD. (Table R3C-12) Other small unincorporated communities

TABLE R3C-10

SYNFUELS EIS PROJECTS
PROJECT SPECIFIC COMMUTING ASSUMPTION

Percent of Direct Employment Job Holders Residing in CCD

Project	VERNAL Const.[1]	VERNAL Oper.	ROOSEVELT Const.[1]	ROOSEVELT Oper.	COLORADO Const.[1]	COLORADO Oper.
Geokenitics	.6026	.6276	.3450	.3428	.0524	.0300
Magic Circle	.6066	.6345	.3422	.3369	.0512	.0286
Paraho	.6748	.7601	.2375	.1598	.0877	.0801
Syntana	.6828	.7726	.2302	.1493	.0870	.782
TOSCO	.6166	.6579	.3233	.3027	.0601	.0394
SOHIO	.8831	.9749.	.1029	.0234	.0140	.0017
EnerCor/Mono[2] Power (Rainbow)	.6632	.7415	.2481	.1758	.0887	.827

[1] This represents the percent of construction workers who do not live in the construction camps. All construction workers living in camps reside in the Bonanza CCd.

[2] A good portion of the workers for the P.R. Springs portion of the EnerCor/Mono Power Project are assumed to live in the new town at Westwater and in Grand Junction, Colorado. See discussion in text.

TABLE R3A-11

SUMMARY OF ALLOCATION
of Low Level Development Impacts
(Addition to Baseline)
By Census County Division

	UTAH								COLORADO			
	--Roosevelt--		Uintah-Ouray		------Vernal------		--"Bonanza"[1]		---Rangely[2]		--Dinosaur[2]	
Year	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.
1982	205	30	19	1	583	89	358	671	34	4	27	4
1983	584	86	51	4	1,679	259	1,537	2,391	92	11	72	7
1984	1,760	264	156	12	4,752	754	2,597	5,081	234	30	184	23
1985	3,729	573	333	25	9,909	1,623	2,858	8,043	454	59	356	47
1986	4,584	720	410	30	12,246	2,047	1,974	8,225	521	71	410	55
1987	4,224	688	372	29	11,705	2,112	754	6,324	437	61	343	48
1988	3,982	673	345	27	11,586	2,390	144	4,976	356	53	279	41
1989	4,466	765	372	30	11,985	2,309	154	5,231	383	57	301	45
1990	4,607	816	385	31	12,599	2,468	103	5,151	395	61	310	48
1991	4,891	897	399	34	13,307	2,663	103	5,177	414	66	325	52
1992	5,301	1,003	422	37	14,321	2,925	113	5,276	442	73	348	58
1993	5,769	1,124	448	41	15,472	3,223	123	5,377	475	82	373	64
1994	6,127	1,227	464	44	16,384	3,476	123	5,377	501	88	394	70
1995	6,430	1,320	477	47	17,135	3,702	123	5,377	523	95	411	74
1996	6,715	1,409	488	50	17,838	3,915	123	5,377	543	101	427	79
1997	6,978	1,492	498	52	18,479	4,112	123	5,377	562	106	441	84
1998	7,213	1,568	506	54	19,052	4,292	123	5,377	578	111	454	88
1999	7,423	1,637	513	55	19,559	4,456	124	5,377	592	116	466	91
2000	7,586	1,695	518	57	19,939	4,590	124	5,377	604	120	474	94

1 The Dinosaur CCD area definition was developed for this study and does not correspond to an official census area for 1980.

2 Rangely and Dinosaur impacts for the census county division and for the communities are assumed to be the same.

TABLE R3A-12

UTAH COMMUNITY IMPACTS
Low Level Development Scenario

(Addition to Baseline)

Year	Vernal City		Roosevelt City		Myton Town		Ballard Town	
	Pop.	Households	Pop.	Households	Pop.	Households	Pop.	Households
1982	292	97	123	41	6	2	0	3
1983	840	263	350	109	18	6	20	6
1984	2,376	792	1,056	352	53	18	62	21
1985	4,955	1,709	2,237	771	112	39	133	46
1986	6,123	2,041	2,750	917	138	46	164	55
1987	5,853	1,951	2,534	845	127	42	149	50
1988	5,793	1,869	2,389	771	119	38	138	45
1989	5,993	1,873	2,680	859	134	42	149	47
1990	6,300	1,969	2,764	866	138	43	154	48
1991	6,654	1,986	2,935	889	147	44	160	49
1992	7,161	2,170	3,181	964	159	48	169	51
1993	7,736	2,275	3,461	1,018	173	51	179	53
1994	8,192	2,409	3,676	1,081	184	54	186	54
1995	8,568	2,448	3,858	1,102	193	55	191	55
1996	8,919	2,548	4,029	1,151	201	57	195	55
1997	9,340	2,669	4,187	1,196	209	60	199	56
1998	9,526	2,722	4,328	1,237	216	61	202	57
1999	9,780	2,747	4,454	1,248	223	62	205	57
2000	9,970	2,769	4,552	1,264	228	63	207	58

such as Jensen, Naples, and Maeser would be impacted significantly. However, these communities are unincorporated and possess no legal physical boundaries with which to measure impacts. The magnitude of impacts in the unincorporated portions of each CCD can be determined by subtracting the community impacts from the CCD in which they reside. For example, the impacts in the unincorporated portion of the Vernal CCD is the Vernal CCD impacts minus the impacts allocated to the community of Vernal. Also, it is anticipated that Rangely in Rio Blanco County, Colorado, and Dinosaur in Moffat County, Colorado, would be significantly impacted. (Table R3A-13)

Local area planners have assumed that 50 percent of the Vernal CCD's growth would be absorbed into Vernal City and its planned growth area. In the Roosevelt CCD, 60 percent of the growth is assumed in Roosevelt City and 3 percent in the town of Myton. Of the growth projected for the Uintah-Ouray CCD, 40 percent is assumed to occur in the town of Ballard. These assumptions were based on the areas' abilities to absorb additional people, and also on outlying areas' plans to provide services. For example, additional water and sewer lines plus new housing projects are anticipated to be built outside of Vernal in the Ashley Valley. Thus, the rest of Ashley Valley is projected to receive a great deal of the impact of synfuel development. Many factors are involved in the distribution of future population growth in the areas and some of these factors only represent educated estimates. Future happenings could alter the distribution, such as the incorporation of new cities or changes in existing cities' growth (annexation) plans. However, none would affect the anticipated growth of the area itself, but only the public entity having jurisdiction over the growth.

The Enercor-Mono Power, P.R. Springs project will create no significant impacts under the Low Level Scenario. The Enercor/Mono Power project is considering building a new town at Westwater Utah to accomodate the workers of their project. However, under the Low Level Scenario, this plan is dropped and most workers would commute from Grand Junction, Colorado. However, because of the size of Grand Junction and surrounding communities, the growth will be absorbed without creating a significant impact under the 10 percent rule. Some Enercor workers are projected to live in Moab."

TABLE R3A-13

COLORADO COMMUNITY IMPACTS
Low Level Development Scenario
(Addition to Baseline)

	Rangely		Dinosaur	
	Population	Households	Population	Households
1982	34	11	27	9
1983	92	29	72	22
1984	234	78	184	61
1985	454	157	356	123
1986	521	174	410	137
1987	437	146	343	114
1988	356	115	279	90
1989	383	123	301	97
1990	395	124	310	97
1991	414	125	325	98
1992	442	134	348	106
1993	475	140	373	110
1994	501	147	394	116
1995	523	149	411	117
1996	543	155	427	122
1997	562	161	441	126
1998	578	165	454	130
1999	592	166	466	131
2000	604	168	474	132

Personal Income Impact Projections

The impact on personal income resulting from the construction and operation of the synthetic fuel projects combined with interrelated proposed projects in the study area, is based on: changes in the population of the impact area; changes in the number and industrial mix of jobs in the area; changes in per capita property incomes, transfer payments, and personal contributions to soical insurance; and changes in wage rates in each industrial sector. The relevant population and industry specific employment figures are the employment and population impact projections which were presented in Section R3A of this report.

Average monthly wages for each industrial sector are projected by selecting a representative 1980 wage payment for that sector in the impact area. This figure is increased at the average annual rate of growth of per capita personal income assumed for the State of Utah (1.724 percent per year) in the baseline personal income projection described above. Projected average monthly wages and personal income are presented in 1980 dollars throughout this discussion.

For the construction phases, average monthly construction wages in Emery County, Utah were used as the base figure. This relatively high figure reflects current power plant construction wages and construction wages paid on non-power plant building projects in markets affected by power plant construction. The level of construction activity in Emery County relative to total employment reflects the type of situation that is projected for the study area with the proposed projects. Both the study area and Emery County are similar in terms of isolated, rural locations within a state that has a "right-to-work" law. However, to the extent that synthetic fuel plant construction workers are paid differently from their coal-fired power plant counterparts, this procedure will distort construction phase wages.

The average monthly wage for each of the other industrial sectors is based on the Carbon County, Utah experience. The assumption was based on the similarities of the development mining as a major economic sector in a relatively isolated rural area. Incomes accruing to individual persons, rather than persons as economic producers, are typically categorized as property incomes (interest, rents, dividends) plus transfer payments

(unemployment compensation, welfare) minus individual contributions to social insurance. These components were aggregated into a single category. Per capita income in this category in the State of Utah is assumed to be the same percentage of its national counterpoint as is per capita personal income as a whole (83 percent). The resultant per capita figure is then increased at the same average annual rate as are the various wage rates to produce projection year per capita property income plus transfer payments minus personal social insurance contribution figures.

The impact of the low development scenario on personal income in the entire study area is provided in detail in Table R3A-14 for the years 1984-1995 and the year 2000. Per capita personal income is also included; these figures were based on the total population impact as discussed earlier. Table R3A-15 summarizes personal income projections by county in Utah and for the Colorado area based on the low level population impacts.

Comparison of Baseline and Impact Projections of Income

The baseline per capita personal income projections ranged from $8,217 per year to $8,932 in 1985 in the counties. By the year 2000, the range will be $10,643 to $11,568. For the State of Utah per capita personal income increase from $8,932 in 1985 to $11,568 by year 2000. The projected per capita personal income will peak during the construction phases of both the regional analysis and the site specific analysis. During the construction phase per capita personal income will range from over $18,000 per year to over $20,000; this will more than double the baseline projection of per capita income. This, of course, represents the combined effects of the large number of high wage construction workers in the area along with a low proportion of them bringing families. By 1995 the construction worker effect on the difference between baseline and development impact per capita personal income will become much smaller. The per capita personal income will be in the $13,000 per year range as operations employment reaches maximum levels, as compared to a baseline level of about $10,000. This will represent a significant permanent increase in personal income (about 30 percent).

TABLE RM-14

Low Development Scenario
Personal Income Impact

(Average Figures in 1980 dollars; Total Figures in Thousands of 1980 Dollars)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Mining													
Average Monthly Wage	2,120	2,157	2,194	2,232	2,270	2,309	2,349	2,390	2,431	2,473	2,515	2,559	2,603
Number of Employees	557	2,429	3,860	4,667	5,213	5,477	5,702	5,801	5,900	6,000	5,999	5,998	5,999
Total Wage Payment	24,347	62,862	101,619	124,982	142,011	151,775	160,734	166,344	172,100	178,034	181,073	184,164	187,245
Construction													
Average Monthly Wage	2,581	2,625	2,670	2,716	2,763	2,811	2,859	2,909	2,959	3,010	3,062	3,114	3,168
Number of Employees	4,405	7,444	6,163	3,533	819	639	363	324	367	413	455	494	657
Total Wage Payment	136,407	234,489	197,484	115,161	27,156	21,553	12,455	11,308	13,030	14,916	16,716	18,462	24,977
Manufacturing													
Average Monthly Wage	878	893	909	924	940	956	973	990	1,007	1,024	1,042	1,060	1,078
Number of Employees	22	56	65	64	57	61	65	70	77	84	90	95	115
Total Wage Payment	232	600	709	710	643	700	759	831	930	1,032	1,125	1,268	1,488
Transp., Communications & Utilities													
Average Monthly Wage	1,847	1,879	1,911	1,944	1,978	2,012	2,047	2,082	2,118	2,154	2,191	2,229	2,268
Number of Employees	53	133	157	153	136	145	153	164	178	194	207	218	243
Total Wage Payment	1,175	2,999	3,601	3,570	3,228	3,501	3,757	4,097	4,523	5,015	5,443	5,831	7,156
Wholesale & Retail Trade													
Average Monthly Wage	830	844	859	874	889	904	919	935	951	968	985	1,002	1,019
Number of Employees	372	810	951	927	825	803	932	999	1,064	1,179	1,256	1,326	1,569
Total Wage Payment	3,207	8,205	9,800	9,717	8,797	9,578	10,283	11,213	12,376	13,693	14,862	15,936	19,426
Finance, Insurance & Real Estate													
Average Monthly Wage	909	925	941	957	973	990	1,007	1,025	1,042	1,060	1,079	1,097	1,116
Number of Employees	41	104	123	122	112	120	128	138	151	165	177	188	231
Total Wage Payment	447	1,154	1,388	1,401	1,308	1,426	1,547	1,697	1,889	2,099	2,291	2,475	3,093
Services													
Average Monthly Wage	754	767	780	793	807	821	835	850	864	879	894	910	925
Number of Employees	204	521	617	606	543	585	622	674	722	801	858	908	1,105
Total Wage Payment	1,845	4,794	5,775	5,770	5,259	5,764	6,234	6,872	7,488	8,451	9,208	9,913	12,271
Government													
Average Monthly Wage	916	931	947	964	980	997	1,014	1,032	1,050	1,068	1,086	1,105	1,124
Number of Employees	372	914	1,085	1,051	918	970	1,019	1,109	1,242	1,397	1,530	1,649	2,116
Total Wage Payment	3,977	10,214	12,334	12,154	10,799	11,607	12,404	13,732	15,644	17,900	19,942	21,863	28,539
Non-Farm Proprietors (NFP)													
Average Monthly Wage	1,209	1,230	1,251	1,273	1,295	1,317	1,340	1,363	1,386	1,410	1,435	1,459	1,484
Number of Employees	109	283	335	334	303	334	365	403	449	498	542	582	739
Total Wage Payment	1,582	4,177	5,030	5,102	4,708	5,279	5,869	6,591	7,470	8,428	9,331	10,192	13,165
Other Labor Income (OLI)													
Average Monthly OLI	104	106	108	110	111	113	115	117	119	121	124	126	128
Total OLI	6,364	12,611	13,822	11,125	8,622	8,881	8,983	9,280	9,731	10,232	10,574	10,877	12,071
Number of Recipients	7,950	15,772	16,833	14,629	11,533	12,084	12,434	13,066	13,938	14,908	15,672	16,399	18,513
Property Income plus Transfer Payments minus Individual contribution for Social Insurance													
Average Property Income	141	144	146	149	151	154	156	159	162	165	167	170	173
Population	10,285	22,080	24,268	22,072	18,349	19,300	20,095	21,249	22,823	24,593	25,975	27,130	31,397
Total Property Income	17,422	38,046	42,537	39,355	33,201	35,756	37,715	40,568	44,325	48,586	52,201	54,662	65,291
TOTAL PERSONAL INCOME	198,591	383,312	397,110	332,551	248,723	259,023	264,191	276,319	293,713	313,062	327,864	341,905	381,165
AVERAGE PER CAPITA INCOME	19,309	17,360	16,364	15,067	13,555	13,365	13,147	12,990	12,869	12,730	12,622	12,602	12,140

TABLE R3A-15

TOTAL PERSONAL INCOME IMPACT BY COUNTY
Low Development Scenario

(1980 Dollars)

		UTAH COUNTIES						COLORADO Area	
	Per	-----Duchesne-----		-----Grand------		-----Uintah-----			
Year	Capita Income	Popul-ation	Personal Income*	Popul-ation	Personal Income*	Popul-ation	Personal Income*	Popul-ation	Personal Income*
1984	$ 19,309	1,786	34,486	53	1,023	7,505	144,914	418	8,071
1985	17,360	3,768	65,412	401	6,961	13,100	227,416	810	14,062
1986	16,364	4,624	75,667	371	6,071	14,630	239,405	931	15,235
1987	15,067	4,256	64,125	391	5,891	12,831	193,325	780	11,752
1988	13,555	4,011	54,369	138	1,871	12,075	163,677	635	8,607
1989	13,365	4,500	60,143	143	1,911	12,511	167,210	684	9,142
1990	13,147	4,644	61,055	158	2,077	13,087	172,055	705	9,269
1991	12,990	4,933	64,080	163	2,117	13,809	179,379	739	9,600
1992	12,869	5,350	68,849	166	2,136	14,856	191,182	790	10,167
1993	12,730	5,826	74,165	169	2,151	16,043	204,227	848	10,795
1994	12,622	6,191	78,143	173	2,184	16,971	214,208	895	11,332
1995	12,602	6,501	81,926	175	2,205	17,735	223,496	934	11,770
2000	12,140	7,686	93,308	178	2,161	20,581	249,853	1,078	13,087

* In thousands of dollars

LOW LEVEL SCENARIO

Housing

Housing is a critical ingredient in determining community stability. Although the impact under the low level scenario is substantially smaller than the high level scenario impacts, the housing market in several of the communities within the study area could still be significantly impacted. A significant impact is defined as a 10 percent growth over the baseline projection.

In 1993, the year that the low level scenario would reach full operations, Uintah County would require 4,682 units to serve the proposed low level scenario projects and 2,910 units for interrelated projects. The cumulative impact of this would require an 88.37 percent increase in housing units over the projected baseline demand. Duchesne County, at the same time, would require 1,714 housing units to serve those employees directly involved in the low level scenario. Another 628 housing units would be required for the proposed interrelated projects. The cumulative low level scenario impacts and interrelated projects would bring a 43.68 percent growth over baseline.

Vernal would be the most significantly impacted community and would would see a 93.44 percent increase in demand for housing over baseline forecasts from this scenario. Roosevelt would see an 84.66 percent growth over baseline under the same scenario, while Ballard's impact would be 35.68 percent higher than the baseline. Myton's housing demand would also grow by 29.08 percent. Table R3B-01 delineates proposed demand for housing.

TABLE R3B-01

LOW LEVEL SCENARIO

HOUSING

	Uintah County		Duchesne County	
	1985	1993	1985	1993
Forecast of Demands: Households				
Baseline Demand	7,706	8,591	5,323	5,362
Low Level Impact	3,532	4,682	1,299	1,714
Interrelated Project Impact	493	2,910	123	628
Cumulative Increase	4,025	7,592	1,422	2,342
Total Demand	11,731	16,183	6,745	7,704
Percent Increase	46.83	54.50	24.40	31.97
Cumulative Percent Increase	52.23	88.37	26.71	43.68

	Vernal		Roosevelt	
	1985	1993	1985	1993
Forecast of Demands: Households				
Baseline Demand	3,087	3,660	1,622	1,714
Low Level Impact	1,709	2,275	771	1,018
Interrelated Project Imp	192	1,145	83	433
Cumulative Increase	1,901	3,420	854	1,451
Total Demand	4,988	7,080	2,476	3,165
Percent Increase	55.36	62.16	47.53	59.39
Cumulative Percent Inc	61.58	93.44	52.65	84.66

	Ballard		Myton	
Forecast of Demands: Households				
Baseline Demand	201	213	205	251
Low Level Impact	46	53	39	51
Interrelated Project Imp	7	23	4	22
Cumulative Increase	53	76	43	73
Total Demand	254	289	248	324
Percent Increase	22.89	24.88	19.02	20.32
Cumulative Percent Inc	26.37	35.68	20.98	29.08

	Rangely		Dinosaur	
	1985	1993	1995	1993
Forecast of Demands: Households				
Baseline Demand	1,116	1,303	176	147
Low Level Impact	157	140	123	110
Interrelated Project Impact	28	276	22	243
Cumulative Increase	185	416	145	353
Total Demand	1,301	1,719	321	500
Percent Increase	14.07	10.74	69.89	74.83
Cumulative Percent Increase	16.58	31.93	82.39	240.14

Education

Student enrollment projections for the Uintah, Duchesne and Rangely School Districts for the peak construction and full operation years are shown in Table R3B-02. The Uintah District will receive the majority of impacts under the lower level scenario; it would require an additional 81 teachers over the baseline in 1985, while Duchesne District would require 30 new teachers. The Rangely District would have a 3 percent growth over baseline projections.

The low scenario would also require substantial additional classrooms. Uintah District could need 81 classrooms, or a 30 percent growth over baseline. Duchesne District and Rangely District would need to have 30 and 6 additional classrooms, respectively, over the baseline.

Additionally, demand would also increase for resource teachers who work with the physically and emotionally handicapped. In similar rapid growth areas 12-15 percent of the entire school age population has required such special education services, often mandating pupil/teacher ratios of 7/1 or 12/1 instead of the normal state guideline of 25/1. Further, consideration of school transportation would also be required since a large share of the current school bus fleet in the impacted communities exceeds or will shortly surpass the state's current guidelines for replacement of once every 10 years. Finally, the low level scenario would stimulate other new education demands that have occurred in similar rapid growth communities, such as extended day care and additional planning needs: computers and additional teacher preparation time to handle the large influx of transient students.

TABLE R3B-02

LOW LEVEL SCENARIO
EDUCATION

	Students		Teachers		Classrooms	
	1985	1993	1985	1993	1985	1993
Uintah District						
Baseline Demand	6818	9160	273	366	273	366
Low Level Proj. Imp	2023	3838	81	154	81	154
Interrelated Proj. Imp	292	2240	12	90	12	90
Cumulative Increase	2315	6078	93	244	93	244
Total Demand	9133	15238	365	610	365	610
Percent Increase	29.67	41.90	29.67	42.08	29.67	42.08
Cumulative Percent Inc.	33.95	66.35	34.07	66.67	34.07	66.67
Duchesne District						
Baseline Demand	4764	5717	191	229	191	229
Low Level Proj. Imp	744	1405	30	56	30	56
Interrelated Proj. Imp	73	483	3	19	3	19
Cumulative Increase	817	1888	33	75	33	75
Total Demand	5581	7605	223	304	223	304
Percent Increase	15.62	24.58	15.71	24.45	15.71	24.45
Cumulative Percent Inc.	17.15	33.02	17.28	32.75	17.28	32.75
Rangely District						
Baseline Demand	5293	6374	212	255	212	255
Low Level Proj. Imp	160	204	6	8	6	8
Interrelated Proj. Imp	29	399	1	16	1	16
Cumulative Increase	189	603	7	24	7	24
Total Demand	5482	6977	219	279	219	279
Percent Increase	3.05	3.20	2.83	3.14	2.83	3.14
Cumulative Percent Inc.	3.61	9.46	3.30	9.41	3.30	9.41

Medical

Although significant growth in bed-need is projected for all the hospitals in the study area, low current utilization rates should allow ample time for adequate preparation for growth. The hospital administrators in the impacted area, in a study by John Short & Associates for the Utah Department of Health, have expressed interest and commitment to meeting the medical needs of their communities under the various growth scenarios. An example of this commitment can be found in the passage of a bond to expand and remodel the Duchesne County Hospital. Table R3B-03 delineates the bed-need that would be required for the impact area under the low scenario, both at the peak of construction in 1988 and at full operation in 1993.

Medical personnel, already in short supply, would prove a larger challenge under either the low or high level scenarios. Table R3B-05 cites the physicians, nurses, and dentists that might be required in 1985. The low level scenario would require almost a third increase over the baseline in Uintah and Duchesne Counties, which will be the primary impact area. Additional emergency medical technicians and ambulances would also need to be added under the low level scenario as shown in Table R3B-04. The Utah Department of Health in the John Short & Associates study, The Impacts of Oil Shale Development on the Health Care Delivery System of the Uintah Basin recommends the consideration of on-site emergency medical/trauma facilities to handle industrial accidents at the oil shale plant sites because of their remote locations. The utilization of facilities of these types could tend to decrease some of the impacts usually felt in rapid growth communities on emergency medical facilities.

TABLE R3B-03

LOW LEVEL SCENARIO

HOSPITAL BEDS

	1985	1993
Uintah County		
Baseline Demand	51	60
Low Level Project Impact	20	32
Interrelated Project Impact	3	19
Cumulative Increase	23	51
Total Demand	74	111
Percent Increase	39.22	53.33
Cumulative Percent Increase	45.10	85
Duchesne County		
Baseline Demand	35	37
Low Level Project Impact	8	12
Interrelated Project Impact	1	4
Cumulative Increase	9	16
Total Demand	44	53
Percent Increase	22.86	32.43
Cumulative Percent Increase	25.71	43.24
Rangely/Dinosaur		
Baseline Demand	49	55
Low Level Project Impact	1	2
Interrelated Project Impact	0	3
Cumulative Increase	1	5
Total Demand	50	60
Percent Increase	2.04	3.64
Cumulative Percent Increase	2.04	9.09

TABLE R3B-04

LOW LEVEL SCENARIO

AMBULANCES, EMT'S DEMAND: 1985-1993

	Ambulances		EMT's	
	1985	1993	1985	1993
Uintah				
Baseline Demand	5	6	36	42
Low Level Project Demand	2	3	14	8
Interrelated Project Dem	0	2	2	14
Cumulative Increase	2	5	16	22
Total Demand	7	9	52	78
Percent Increase	40.00	50.00	38.89	19.05
Cumulative Percent Inc.	40.00	83.33	44.44	52.38
Duchesne				
Baseline Demand	3	4	25	26
Low Level Proj. Dem	1	1	5	8
Interrelated Proj Dem	0	0	0	3
Cumulative Increase	1	1	5	11
Total Demand	4	5	30	37
Percent Increase	33.33	25.00	20.00	30.70
Cumulative Percent Inc.	33.33	25.00	20.00	42.31
Rangely/Dinosaur				
Baseline Demand	5	5	34	38
Low Level Prj. Dem.	0	0	1	1
Interrelated Project	0	0	0	2
Cumulative Increase	0	0	1	3
Total Demand	5	5	35	41
Percent Increase	0	0	2.94	2.63
Cumulative Percent Inc.	0	0	2.94	7.90

TABLE R3B-05
LOW LEVEL SCENARIO
PHYSICIANS, NURSES, DENTISTS DEMAND: 1985-1993

	Medical						Public	
	Doctors		Nurses		Dentists		Health Nurses	
	1985	1993	1985	1993	1985	1993	1985	1993
Uintah and Duchesne								
Baseline Demand	24	27	73	81	21	24	9	10
Low Level Proj. Dem.	8	12	23	36	7	11	3	4
Interrelated Proj. Imp	1	7	3	20	1	6	0	2
Cumulative Increase	9	19	26	56	8	17	3	6
Total Demand	33	46	99	137	30	41	12	16
Percent Increase	33.33	44.44	31.51	44.44	33.33	45.83	33.33	40.00
Cumulative Perc. Inc.	37.50	70.37	35.62	69.16	38.10	70.83	33.33	60.00
Rangely/Dinosaur								
Baseline Demand	14	15	41	46	12	14	5	5.5
Low Scenario Demand	0	0	1	1	0	0	0	0
Interrelated Proj Imp	0	1	0	3	0	1	0	0.5
Cumulative Increase	0	1	1	4	0	1	0	0
Total Demand	14	16	42	50	13	15	5	6
Percent Increase	0	0	2.44	2.17	0	0	0	0
Cumulative Percent Inc.	0	0	2.44	8.70	0	7.14	0	0

Mental Health

No inpatient mental health facilities are available in the study area. Mental health patients who require in-patient facilities need to go to either the Wasatch Front in Utah or Grand Junction, Colorado to get services. The low level scenario would aggravate this shortage, causing an undetermined spill-over impact to, primarily, the Wasatch Front. Patient origin data is inadequate to determine the extent of this spill-over. A proposed comprehensive mental health facility, which is a widely recognized priority need in the study area, would include an in-patient facility, as well as expanded facilities for treating outpatients. Funding for such a facility is currently unavailable.

Tables R3B-06 and R3B-07 highlight the number of mental health staff that would be required under the Low Level Scenario. Uintah and Duchesne Counties would require 3 additional social workers and 1 psychologist/psychiatrist to handle mental health patients in 1985 over the baseline. The growth in demand would moderate slightly by 1993 to a total of 4 social workers and 1 psychologist/psychiatrist. The additional demand for mental health services in the Rangely/Dinosaur area would be minimal.

If mental health services are not expanded, it is probable that some individual needing mental health treatment will go unserved while others increase demand along the Wasatch Front.

TABLE R3B-06

LOW LEVEL SCENARIO

MENTAL HEALTH: PSYCHOLOGISTS/PSYCHIATRISTS

	1985	1993
Uintah and Duchesne		
Baseline Demand	2	2
Low Level Project Impact	1	1
Interrelated Project Impact	0	1
Cumulative Increase	1	2
Total Demand	3	4
Percent Increase	50.00	50.00
Cumulative Percent Increase	50.00	100.00
Rangely/Dinosaur		
Baseline Demand	1	1
Low Level Project Impact	0	0
Interrelated Project Impact	0	0
Cumulative Increase	0	0
Total Demand	1	1
Percent Increase	0	0
Cumulative Percent Increase	0	0

TABLE R3B-07

LOW LEVEL SCENARIO
MENTAL HEALTH: SOCIAL WORKERS

	1985	1993
Uintah and Duchesne		
Baseline Demand	9	10
Low Level Project Impact	3	4
Interrelated Project Impact	0	2
Cumulative Increase	3	6
Total Demand	12	16
Percent Increase	33.33	40.00
Cumulative Percent Increase	33.33	60.00
Rangely/Dinosaur		
Baseline Demand	5	5
Low Level Project Demand	0	0
Interrelated Project Demand	0	0
Cumulative Increase	0	0
Total Demand	5	5
Percent Increase	0	0
Cumulative Percent Increase	0	0

Law Enforcement

The increase in population under the low level scenario can be expected to increase crime. The actual crime increase would occur cannot be predicted. Under the low level scenario, Uintah County could require 43 officers in 1985, while Duchesne could require 26 officers and Rangely 51 officers. The growth in the Rangely/Dinosaur area would be minimal. The demand for police cars would also increase under the low level scenario, as indicated on Table R3B-08.

In addition to more police officers and patrol cars, the law enforcement agencies will also require additional support staff. A study should be considered on unifying all Uintah County law enforcement dispatching. This unification would decrease potential overlaps and more efficiently and expeditiously provide service.

A recent study by the Utah Comprehensive Emergency Management Division identified the following law enforcement needs under either the high or low scenario:

- an alcohol detoxification center and additional prevention and rehabilitation programs for alcohol and drug abuse.
- crime prevention programs such as anti-vandalism campaigns and neighborhood "Crime Watch" programs.
- alternatives to incarceration programs (halfway houses, proctor advocate programs, etc.) to reduce costs.

TABLE R38-08a

LOW LEVEL SCENARIO
LAW ENFORCEMENT

	Police Officers	
	1985	1993
Duchesne County		
Baseline Demand	23	24
Low Level Project Impact	3	4
Interrelated Project Impact	0	1
Cumulative Increase	3	5
Total Demand	26	29
Percent Increase	13.04	16.67
Cumulative Percent Increase	13.04	20.83
Uintah County		
Baseline Demand	31	35
Low Level Project Impact	10	16
Interrelated Project Impact	2	12
Cumulative Increase	12	28
Total Demand	43	63
Percent Increase	32.26	45.71
Cumulative Percent Increase	38.71	80.00
Rangely/Dinosaur		
Baseline Demand	49	55
Low Level Project Impact	2	2
Interrelated Project Impact	0	3
Cumulative Increase	2	5
Total Demand	51	60
Percent Increase	4.08	3.64
Cumulative Percent Increase	4.08	9.09

TABLE R3B-08b

LOW LEVEL SCENARIO
LAW ENFORCEMENT

	Patrol Cars	
	1985	1993
Duchesne County		
Baseline Demand	6	6
Low Level Project Impact	1	1
Interrelated Project Impact	0	0
Cumulative Increase	1	1
Total Demand	7	7
Percent Increase	16.67	16.67
Cumulative Percent Increase	16.67	16.67
Uintah County		
Baseline Demand	8	9
Low Level Project Impact	3	4
Interrelated Project Impact	0	3
Cumulative Increase	3	7
Total Demand	11	16
Percent Increase	37.50	44.44
Cumulative Percent Increase	37.50	77.78
Rangely/Dinosaur		
Baseline Demand	12	14
Low Level Project Impact	1	0
Interrelated Project Impact	0	1
Cumulative Increase	1	1
Total Demand	13	15
Percent Increase	8.33	7.14
Cumulative Percent Increase	8.33	7.14

Fire Protection

Continued energy-related growth under the low level scenarios will increase the demand for additional fire stations.

Most rural Utah communities, and all within the study area, have problems with their distribution systems because of the inadequate size of the transmission pipes. The majority of water systems in the study area have 4-inch transmission pipes prevalent forty years ago when they were constructed. Today a six-inch pipe is standard in constructing water transmission lines.

The rapid growth in the impacted communities under the low level scenario could bring some common boomtown pressure to lower fire safety standards. The State Division of Comprehensive Emergency Management, in a recent study, recommends that fire safety standards be preserved even among temporary housing units. Some Wyoming boomtowns have reported problems with fire safety in mobile homes brought in from warmer climates that are both underinsulated and have inadequate furnaces for the region's cold winters. This had led to an increase in mobile home fires.

Libraries

In the discussion under Affected Environment the inadequacy over the current library facilities within the impacted area is delineated. The low level scenario can be expected to exacerbate this shortage. If state guidelines were to be met, the number of books within Uintah County would need to be expanded from the current 25,209 to 111,186 at full operations in 1993 (see Table R3B-09). Duchesne County would have to grow from their current 250 books to 53,260 in the same period. In Rangely, the demand from the projects would provide a small 3.1 percent impact. Additional space as delineated in Table R3B-10 would be required to accommodate the projected need for library expansion.

TABLE R3B-9

LOW LEVEL SCENARIO

LIBRARIES: BOOKS

	1985	1993
Uintah County		
Baseline Demand	51,460	59,964
Low Level Project Impact	20,484	31,840
Interrelated Project Impact	2,906	19,382
Cumulative Increase	23,390	51,222
Total Demand	74,850	111,186
Percent Increase	39.81	53.10
Cumulative Percent Increase	45.45	85.42
Duchesne County		
Baseline Demand	35,556	37,424
Low Level Project Impact	7,536	11,652
Interrelated Project Impact	726	4,184
Total Demand	43,818	53,260
Percent Increase	21.20	31.14
Cumulative Percent Increase	23.24	42.32
Rangely/Dinosaur		
Baseline Demand	48,710	54,576
Low Level Project Impact	1,620	1,696
Interrelated Project Impact	292	3,456
Cumulative Increase	1,912	5,152
Total Demand	50,622	59,728
Percent Increase	3.33	3.11
Cumulative Percent Increase	3.93	9.44

TABLE R3B-10

LOW LEVEL SCENARIO

LIBRARIES: SPACE (sq. ft.)

	1985	1993
Uintah County		
Baseline Demand	12,865	14,991
Low Level Project Impact	5,121	7,960
Interrelated Project Impact	726.5	4,846
Cumulative Increase	5,847.5	12,806
Total Demand	18,713	27,797
Percent Increase	31.81	53.10
Cumulative Percent Increase	45.45	85.43
Duchesne County		
Baseline Demand	8,889	9,356
Low Level Project Demand	1,844	2,913
Interrelated Project Demand	181.5	1,046
Cumulative Increase	2,025.5	3,959
Total Demand	10,955	13,315
Percent Increase	20.75	31.14
Cumulative Percent Increase	22.79	42.35
Rangely/Dinosaur		
Baseline Demand	12,178	13,644
Low Level Project Demand	405	424
Interrelated Project Demand	73	864
Cumulative Increase	478	864
Total Demand	12,656	14,932
Percent Increase	3.33	3.11
Cumulative Percent Increase	3.92	9.44

Parks

The projected impact areas have abundant outdoor recreational opportunities, particularly within the national and state parks. Hiking, camping, boating, and fishing are easily accessible throughout the area. In fact, thousands of acres of federal and state lands are available within the study area for recreation. Indirect impacts would be felt by the increased utilization of these facilities, particularly in increased operations and maintenance costs within the parks. Daggett County, the home of Utah's Flaming Gorge Reservoir, would also feel the indirect impacts from increased utilization because of their close proximity to the impact area.

Neighborhood parks would require expansion if the low level scenario occurred, as shown in Table R3B-11. Ample recreational opportunities at the neighborhood level have assisted other rapid growth communities in integrating the new population with the older, more established, residents. Adequate recreational facilities provide a therapuetic outlet for those facing the stress of change from rapid growth and strained amenities. Within the Vernal area, where the most extensive growth is projected to occur under the low level scenarios, the projects within the EIS would stimulate the need for 50.32 acres of additional neighborhood parks at full operations in 1993. Roosevelt would require an additional 29 acres at the same time. The total demand for neighborhood parks would reach 179 acres in Rangely at full operations, although the low level share of impact would be only 5 acres.

TABLE R3B-11

LOW LEVEL SCENARIO

PARKS (acres)

	Vernal		Roosevelt	
	1985	1993	1985	1993
Forecast of Demand: Parks				
Baseline Demand	55.74	68.52	32.52	35.70
Low Level Project Impact	29.76	46.44	13.44	20.76
Interrelated Project Impact	3.42	22.86	1.44	8.64
Cumulative Increase	33.18	69.30	14.88	29.40
Total Demand	88.92	137.82	47.40	65.10
Percent Increase	53.39	67.78	37.84	58.15
Cumulative Percent Increase	59.53	101.14	41.89	82.35

	Ballard		Myton		Rangely/Dinosaur	
	1985	1993	1985	1993	1985	1993
Forecast of Demand: Parks						
Baseline Demand	4.56	5.94	4.26	4.56	146.16	163.74
Low Level Project Impact	0.78	1.08	0.66	1.02	4.86	5.10
Interrelated Proj. Imp	0.12	0.48	0.07	0.43	0.90	10.38
Cumulative Increase	0.90	1.56	0.73	1.45	5.76	15.48
Total Demand	5.46	7.50	4.99	6.01	151.92	179.22
Percent Increase	17.11	18.18	15.49	22.37	3.33	3.11
Cumulative Percent Inc.	19.74	26.26	17.14	31.80	3.94	9.45

Sewer

The communities of Myton, Roosevelt and Vernal would see a significant increase in demand for sewer services under the low level scenario as shown in Table RB3-12. In 1993, Myton would see an increase of daily demand from the baseline forecast of 77,500 to a low level cumulative scenario demand of 102,000 waste flow gallons per day. This demand could be handled adequately within the system's current capacity.

Roosevelt would see the projected baseline sewer demand grow from 594,800 waste flow gallons per day to 1,085,000 waste flow gallons per day under the low level scenario. This growth in demand would also be able to be absorbed within the city's current system.

Vernal needs to complete the sewer system already under construction to absorb even the baseline demand of 1,142,100 waste flow gallons per day. If the system is completed on schedule, it should be able to absorb the additional growth projected under the low level scenario of 2,297,100 waste flow gallons per day.

TABLE R3B-12

LOW LEVEL SCENARIO

SEWER

	Myton		Vernal	
	1985	1993	1985	1993
Forecast of Demands: Water Flow Gallons				
Baseline Demand	70,500	77,500	929,100	1,142,100
Low Level Demand	11,200	17,300	495,500	773,600
Interrelated Project Demand.	1,200	7,200	56,500	381,400
Cumulative Increase	12,400	24,500	552,000	1,155,000
Total Demand	82,900	102,000	1,481,100	2,297,100
Percent Increase	15.89	22.32	5.33	67.73
Cumulative Percent Increase	17.59	31.62	5.94	101.13
	Roosevelt		Rangely/Dinosaur	
Forecast of Demands: Water Flow Gallons				
Baseline Demand	541,600	594,800	369,400	414,500
Low Level Demand	223,700	346,100	81,000	84,800
Interrelated Project Demand.	24,400	144,100	14,600	172,800
Cumulative Increase	248,100	490,200	94,600	257,600
Total Demand	789,700	1,085,000	465,000	672,100
Percent Increase	41.30	58.19	21.93	20.46
Cumulative Percent Increase	45.81	82.41	25.88	62.15

Water

The low level scenario would bring a significant growth in demand for water to the communities of Vernal, Ballard, Roosevelt, and Myton as shown in Table R3B-13. Myton would see the number of connections grow from 201 to under the baseline in 1993. Roosevelt could see a baseline demand of 1,714 connections in 1993 grow by 1,018 connections if the low level scenario occurs. This represents a 60 percent growth over baseline. This could not be absorbed in its current system.

Ballard's projected 251 connections under the baseline could need to grow by 53 connections under the low level scenario. Ballard would need to expand its system and acquire additional water rights to meet the forecast demand in 1993 under the low level scenario. Vernal would need to see the completion of its proposed water system expansion if it were to handle the low level scenario demand in 1993 for 2,275 water connections above baseline projections.

TABLE R3B-13

LOW LEVEL SCENARIO

WATER

	Vernal		Roosevelt		Ballard		Myton		Rangely		Dinosaur	
	1985	1993	1985	1993	1985	1993	1985	1993	1985	1993	1985	1993
Forecast of Demands: Connections (GPCD)												
Baseline Demand	3,087	3,660	1,622	1,714	205	251	201	213	1,116	1,303	176	147
Low Level Demand	1,709	2,275	771	1,018	46	53	39	51	157	140	123	110
Interrelated Project Dem.	192	1,145	83	433	7	23	4	22	28	276	22	243
Cumulative Increase	1,901	3,420	854	1,451	53	76	43	73	185	416	145	353
Total Demand	4,988	7,080	2,476	3,165	258	327	244	286	1,301	1,719	321	500
Percent Increase	55.36	62.16	47.53	59.39	22.44	21.12	19.40	23.9	14.07	10.74	69.89	74.83
Cumulative Percent Incr.	61.58	93.44	52.65	84.66	25.85	30.28	21.39	34.27				
Forecast of Demands: Water Rights (GPCD) (by thousands)												
Baseline Demand	2,470	2,928	1,298	1,371	164	201	161	170	893	1,042	141	118
Low Level Demand	1,367	1,820	617	81	37	42	31	41	126	112	98	88
Interrelated Project Dem.	154	916	66	346	6	18	3	18	22	221	18	194
Cumulative Increase	1,521	2,736	683	1,161	42	61	34	58	148	333	116	282
Total Demand	3,991	5,664	1,981	2,532	206	262	195	229	1,041	1,375	257	400
Percent Increase	55.36	61.16	47.53	59.39	22.44	21.12	19.40	23.94	14.07	10.74	69.89	69.89
Cumulative Percent Incr.	61.58	93.44	52.65	84.66	25.85	30.28	21.39	34.27	16.58	31.93	82.39	82.39
Forecast of Demands: Well Pr. (GPCD) (In thousands)												
Baseline Demand	4,939	5,856	2,595	742	328	402	322	341	1,786	2,084	282	236
Low Level Demand	2,734	3,640	1,234	1,629	64	85	62	82	252	224	196	176
Interrelated Proj. Dem.	307	1,832	133	693	11	37	6	35	44	442	36	388
Cumulative Increase	3,142	5,472	1,366	2,302	85	122	69	117	296	666	232	564
Total Demand	7,981	1,328	3,962	5,064	413	523	390	458	2,082	2,750	514	800
Percent Increase	55.36	61.16	47.53	59.39	22.44	21.12	19.40	23.94	14.07	10.74	69.89	69.89
Cumulative Percent Incr.	61.58	93.44	52.65	84.66	25.85	30.28	21.39	34.27	16.58	31.93	82.39	82.39
Forecast of Demands: Storage (GPCD) (In thousands)												
Baseline Demand	2,470	2,928	1,298	1,371	164	201	161	170	893	1,042	141	118
Low Level Demands	1,367	1,820	617	814	37	42	31	41	126	112	98	88
Interrelated Proj.Dem.	154	916	66	346	6	18	3	18	22	221	18	194
Cumulative Increase	1,521	2,736	683	1,161	42	61	34	58	148	333	116	282
Total Demand	3,990	5,664	1,981	253	206	262	195	229	1,041	1,375	257	400
Percent Increase	55.36	62.16	47.53	59.39	22.44	21.12	19.40	23.94	14.07	10.74	69.89	69.89
Cumulative Percent Incr.	61.58	93.44	52.65	84.66	25.85	30.28	21.39	34.27	16.58	31.93	82.39	82.39
Forecast of Demands: Supply (GPCD) (In thousands)												
Baseline Demand	4,939	5,856	2,595	72	33	402	322	341	1,786	2,084	282	236
Low Level Demands	2,734	3,640	1,234	1,629	74	85	62	82	252	224	196	176
Interrelated Proj. Dem.	307	1,832	133	693	11	37	6	35	44	442	36	388
Cumulative Increase	3,142	5,472	1,366	2,302	85	122	69	117	296	666	232	564
Total Demand	7,981	1,328	3,962	5,064	413	523	390	458	2,082	2,750	514	800
Percent Increase	55.36	61.16	47.53	59.39	22.44	21.12	19.40	23.94	14.07	10.74	69.89	69.89
Cumulative Percent Incr.	61.58	93.44	52.65	84.66	25.85	30.28	21.39	34.27	16.58	31.93	82.39	82.39

HIGH DEVELOPMENT SCENARIO

The High Level Development Scenario consists of the same seven projects as the Low Scenario. However, the productions level will increase from 123,400 barrels of oil a day to 320,500 barrels a day. Yet, because of various economies of scale, the impacts will not increase by the same ratio. The High Scenario represents the full level of planned production of all seven projects being anticipated. Thus, this Scenario represents the worse case (in terms of impact) situation. Discussion of the High Development Scenario follows the same organization as did the Low; i.e., the work force assumptions are presented followed by total regional impacts, county allocations, CCD level allocations, and the community level allocations.

Work Force Assumptions

Table R3A-16 presents the direct basic employment assumptions for the High Level Development Scenario. The construction work force under the High Scenario peaks at 9,855 in 1985, but the total work force (construction plus operations) peaks at 13,440 in 1986. In 1995 all projects will have completed construction and will have a stable work force. The years 1985 and 1995 will thus represent the peak years for analysis.

As can be seen in Table R3A-16, the work force assumptions (including the size of the work camp) change considerably for all projects except for the Enercor-Mono Power Rainbow project. Also, the mix of construction to operations changes year by year; consequently, the impact will not follow the Low Scenario at a linear rate.

On a project-by-project basis the same data sources were used as were used on the Low Scenario; and the same basic assumptions were utilized; however, the total work forces and total production levels have increased. Exceptions to this are the Paraho project and the Enercor-Mono Power Project. The differences are explained below.

TABLE ROA-16

DIRECT EMPLOYMENT ASSUMPTIONS*
(High Level Development Scenario

PROJECT	BARRELS OF OIL	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
GEOKINETICS																
(Lofreco)	50,000															
Const.-camp		0	0	0	20	40	60	80	100	120	140	160	180	200	200	200
Const.-noncamp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations		0	0	0	130	260	390	520	650	780	910	1,040	1,170	1,300	1,300	1,300
(Agency Draw)	20,000															
Const.-camp		0	0	0	110	300	240	0	0	80	30	0	0	0	0	0
Const.-noncamp		0	0	0	370	480	800	0	0	240	90	0	0	0	0	0
Operations		0	0	0	0	320	320	640	640	640	720	720	720	720	720	720
SYNTANA-UTAH	57,000															
Const.-camp		0	0	160	630	1,000	125	80	460	885	100	80	460	885	40	0
Const.-noncamp		0	0	80	320	525	65	45	240	465	50	45	240	465	25	0
Operations		0	0	000	000	255	660	790	780	910	1,290	1,400	1,400	1,525	1,975	2,100
ENERGOR-MONDRAMER																
(P.R. Springs)	50,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	715	2,215	1,685	1,605	965	300	0	0	0	0	0	0
Operations		0	0	0	0	0	0	250	500	1,150	1,325	1,500	1,500	1,500	1,500	1,500
(Rainbow)	5,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	130	200	200	75	0	0	0	0	0	0	0	0	0	0
Operations		0	0	60	120	275	275	275	275	275	275	275	275	275	275	275
PARACO	42,000															
Const.-camp		0	0	775	1,200	1,575	1,190	350	0	0	0	0	0	0	0	0
Const.-noncamp		0	110	150	230	500	165	200	0	0	0	0	0	0	0	0
Operations		0	0	0	0	725	960	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
TOSCO	45,000															
Const.-camp		0	0	70	290	980	1,350	720	90	40	0	0	0	0	0	0
Const.-noncamp		0	0	120	480	1,645	2,240	1,200	150	75	0	0	0	0	0	0
Operations		0	0	25	330	510	665	1,340	2,070	2,185	2,185	2,185	2,185	2,185	2,185	2,185
SOHIO	20,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	0	0	0	450	1,525	375	0	0	0	0	0	0
Operations		0	0	0	0	0	0	0	0	445	820	820	820	820	820	820
MAGIC CIRCLE	31,500															
Const.-camp		0	300	500	500	500	800	700	0	0	0	0	0	0	0	0
Const.-noncamp		0	80	225	50	20	20	80	0	0	0	0	0	0	0	0
Operations		0	60	175	450	835	1,430	1,755	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890
UINTAH BASIN TOTAL	270,500															
Const.-camp		0	300	1,505	2,750	4,395	3,765	1,930	650	1,125	270	240	640	1,085	240	200
Const.-noncamp		0	320	775	1,650	3,245	3,290	1,575	1,915	1,155	140	45	240	465	25	0
Operations		0	60	260	1,030	3,180	4,700	6,420	7,405	8,225	9,190	9,480	9,560	9,815	10,265	10,390
SOUTHEAST MCO TOTAL	50,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	715	2,215	1,685	1,605	965	300	0	0	0	0	0	0
Operations		0	0	0	0	0	0	250	500	1,150	1,325	1,500	1,500	1,500	1,500	1,500
GRAND TOTAL	320,500															
Const.-camp		0	300	1,505	2,750	4,395	3,765	1,930	650	1,125	270	240	640	1,085	240	200
Const.-noncamp		0	320	775	2,365	5,460	4,975	3,580	2,880	1,455	140	45	240	465	25	0
Operations		0	60	260	1,030	3,180	4,700	6,670	7,905	9,375	10,515	10,980	11,060	11,315	11,765	11,890
TOTAL EMPLOYMENT		0	680	2,540	6,145	13,035	13,440	12,180	11,435	11,955	10,925	11,215	12,915	12,865	12,030	12,090

Enercor-MonoPower:

Under the High Scenario, the Enercor project anticipates building a new town at Westwater, in Grand County. This town is anticipated to house approximately 70 percent of the work force and will have an ultimate size of 5,000. Assumptions concerning the size of this new town were provided by Jim Webster, a consultant to the Enercor project.

PARAHO:

Under the High Development Scenario, the Paraho project does anticipate development to a full commercial size project and does not discontinue operations in 1987 as is the case under the Low Scenario. Full operations are achieved in 1987 with 1,100 workers.

The assumption of import substitution discussed in the Low Development Scenario also applies to the High Development Scenario. Thus, the same proportions of Uintah Basin demand for goods and services is assumed to be met locally in the two scenarios. The regional level projections of the impacts of the High Development Scenario are summarized in Table R3A-17 and R3A-18. The major difference between these figures and those for the Low Development Scenario are the larger total permanent impact. In addition the longer construction interval eliminates the post construction peak bust. The total permanent population impact is 184 percent higher than the Low Development Scenario impact. Differences between the two development scenarios in other projection categories--employment, households, labor force, and school-age population--are all roughly comparable with those for population impacts. Again, however, the proportional difference between school-age population in the High Development and baseline projections is greater than the corresponding proportional difference for total population. This differential reflects the significantly younger population expected with major energy developments.

TABLE R3A-17

TOTAL REGIONAL IMPACTS*
High Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Basic	Households Impact	Labor Force Impacts	School-Age Population (5-17) Impacts
1982	1,322	831	680	343	814	209
1983	4,455	2,984	2,540	942	2,939	614
1984	12,333	7,619	6,145	3,183	7,482	1,924
1985	28,916	16,896	13,035	8,264	16,545	4,867
1986	31,807	17,928	13,440	9,392	17,528	5,588
1987	32,201	17,141	12,180	10,,015	16,685	5,988
1988	33,921	16,993	11,435	10,917	16,589	6,502
1989	36,380	17,990	11,955	11,271	17,651	6,777
1990	36,193	17,204	10,925	11,253	16,869	6,858
1991	38,970	18,111	11,215	11,998	17,704	7,704
1992	42,491	19,511	11,940	12,796	19,113	8,839
1993	46,490	21,224	12,865	13,705	20,798	10,271
1994	47,583	20,934	12,030	14,103	20,502	11,444
1995	50,128	21,650	12,090	14,701	21,197	12,868
1996	52,354	22,247	12,090	15,208	21,822	14,232
1997	54,148	22,761	12,090	14,613	22,324	15,427
1998	55,712	23,224	12,090	15,973	22,781	16,473
1999	57,090	23,645	12,090	16,305	23,197	17,370
2000	58,357	24,037	12,090	16,636	23,597	18,163

* These represent impacts in all seven counties of the study area including Uintah, Duchesne, Daggett, Grand, Rio Blanco, Moffatt, and Mesa Counties. However, the impacts were significant only in 5 of the 7 counties. For the Counties of Daggett and Mesa, the impacts were not significant and no further analysis for these counties is included. The county impacts provided in the tables which follow do not sum to the regional total since Daggett and Mesa Counties are not included.

TABLE R3A-18
TOTAL REGIONAL IMPACTS
High Development Scenario
Employment Impacts By Industry

Industry	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mining (Including Synfuels)	60	261	1,052	3,226	4,766	6,756	8,011	9,501	10,660	11,095	11,244	11,519	11,968	12,092	12,089
Contract Construction	629	2,307	5,192	10,076	8,982	5,774	3,825	2,907	752	670	1,311	2,034	806	806	1,058
Manufacturing	3	8	27	71	82	90	101	109	114	124	135	148	156	166	200
Trans., Commun., & Utilities	7	20	65	170	197	216	242	262	271	295	321	351	369	392	471
Trade	41	121	398	1,032	1,194	1,313	1,465	1,588	1,647	1,791	1,946	2,121	2,232	2,368	2,829
Finance, Ins., & Real Estate	5	15	50	133	154	173	196	218	229	252	275	301	318	339	415
Services	26	76	253	665	774	857	964	1,051	1,096	1,205	1,312	1,438	1,521	1,621	1,974
Government	46	135	444	1,163	1,362	1,494	1,661	1,769	1,814	1,990	2,210	2,467	2,660	2,893	3,780
Non-Farm Prop.	14	40	137	361	418	467	528	585	620	689	763	845	904	973	1,222
TOTAL	831	2,984	7,619	16,896	17,928	17,141	16,993	17,990	17,204	18,111	19,511	21,224	20,934	21,651	24,037

County Level Projections

Allocations of the total impact have been made to the same counties as those in the Low Level projections plus Grand County. Under the High Level Scenario, the Enercor-Mono Power project does plan to build the new town at Westwater. If this new town is built, then a substantial number of the work force will choose to live there, and significant impacts will occur in Grand County. However, these impacts will be centered in the new town and not in existing Grand County communities.

In Duchesne County the population impact during 1986 will be nearly 6,000, a 26 percent increase over the baseline projection (Table R3A-19). During 1995, after full operation occurs, the impact will be 9,800 or a 52 percent increase over the baseline projection. By the year 2000 the impact will grow to 11,700, or a 64 percent increase over the baseline.

In Uintah County the population impact during 1985 will be 17,300, a 67 percent increase over the baseline. (Table R3A-20) In the year 1995 the impact rises to 32,300 which is a 108 percent increase, and by the year 2000 the impact has grown to nearly 38,000 or an impact of 131 percent. Thus, the population of Uintah County will more than double by development of the High Scenario.

In Grand County the impacts will be 4,000 in 1985, 4,000 in 1995, and 4,100 in the year 2000. These represent increases of 41 percent, 38 percent, and 43 percent respectively. As mentioned earlier, the longer construction cycle prevelant in the High Scenario combined with project plans for construction camps have nearly eliminated the post construction bust in Duchesne, Uintah Rio Blanco, and Moffat Counties. This will not be true however, in Grand County where the population impact will peak at 4,000 in 1985 and decline to 3,000 in 1990 before surging forward again. (Tables in Appendix L.)

For Colorado the population impact will be considerably smaller than in the Utah counties; 1,000 in 1985, 1,800 in 1995 and 2,100 in the year 2000. These represent 4, 7, and 8 percent increases, respectively. (Table R3A-21) On a county basis the impacts will not be significant.

Employment impacts will be most significant in construction and mining (includes synfuel) for Uintah and Grand Counties. All counties will be impacted significantly in trade, services, and government since these sectors will be the primary sectors serving the new population moving into the area. (Tables R3A-22, R3A-23, R3A-24).

TABLE R3A-19

DUCHESNE COUNTY
High Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Employment Impact Basic	Households Impact	School-Age Population (5-17) Impacts
1982	252	37	0	85	52
1983	740	110	0	239	155
1984	1,997	302	0	668	403
1985	4,602	719	0	1,560	916
1986	5,950	942	0	2,003	1,188
1987	5,932	974	0	1,971	1,175
1988	6,049	1,028	0	1,990	1,183
1989	6,598	1,132	0	2,115	1,269
1990	6,996	1,226	0	2,193	1,336
1991	7,461	1,340	0	2,332	1,484
1992	8,171	1,499	0	2,476	1,726
1993	8,952	1,680	0	2,712	2,026
1994	9,245	1,784	0	2,719	2,235
1995	9,779	1,929	0	2,876	2,511
1996	10,273	2,066	0	3,021	2,804
1997	10,676	2,186	0	3,050	3,053
1998	11,038	2,297	0	3,154	3,276
1999	11,361	2,398	0	3,246	3,470
2000	11,651	2,491	0	3,329	3,639

TABLE R3A-20

UINTAH COUNTY
High Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Population in Communities*	Employment Impact Total	Basic	Households Impact	School-Age Population (5-17) Impacts
1982	1,004	696	785	680	236	143
1983	3,533	2,002	2,851	2,540	646	420
1984	7,998	5,201	6,256	5,430	1,739	1,050
1985	17,309	12,850	12,910	10,820	4,356	2,557
1986	20,066	16,246	14,430	11,755	5,470	3,244
1987	19,966	18,008	13,332	10,325	5,983	3,566
1988	22,180	21,522	13,576	9,970	7,080	4,208
1989	23,438	22,303	14,320	10,505	7,148	4,289
1990	23,136	22,862	13,586	9,600	7,167	4,364
1991	24,629	24,386	14,050	9,715	7,621	4,850
1992	27,118	26,474	15,236	10,440	8,022	5,591
1993	30,010	28,916	16,705	11,365	8,736	6,543
1994	30,581	30,338	16,253	10,525	8,923	7,333
1995	32,343	32,138	16,775	10,590	9,452	8,253
1996	33,854	33,649	17,179	10,590	9,897	9,183
1997	35,062	34,856	17,526	10,590	9,959	9,969
1998	36,138	35,931	17,841	10,590	10,266	10,664
1999	37,090	36,884	18,130	10,590	10,538	11,264
2000	37,937	37,730	18,393	10,590	10,780	11,783

* The difference between the population living in communities and population impact are those living in the work camps.

TABLE R3A-21

COLORADO (Rio Blanco-Moffat Counties)
High Level Development Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Basic	Households Impact	School-Age Population (5-17) Impacts
11982	69	0	0	23	14
1983	180	0	0	58	38
1984	418	54	0	140	84
1985	1,030	136	0	649	205
1986	1,198	162	0	403	239
1987	1,142	160	0	379	226
1988	1,089	157	0	358	213
1989	1,341	194	0	430	258
1990	1,266	189	0	397	242
1991	1,349	206	0	422	268
1992	1,479	232	0	448	312
1993	1,648	263	0	498	373
1994	1,714	282	0	504	414
1995	1,821	307	0	536	468
1996	1,901	328	0	559	519
1997	1,964	346	0	561	562
1998	2,021	362	0	577	600
1999	2,071	376	0	592	632
2000	2,115	389	0	604	661

TABLE R3A-22

DUCHESNE COUNTY
High Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	1	1	0	0	0
Contract Construction	44	91	133	158	214
Manufacturing	22	43	61	71	93
Transp., Comm., & Utilities	28	48	63	71	88
Wholesale & Retail Trade	206	335	437	485	592
Finance, Insurance & Real Estate	27	45	60	67	85
Services	103	189	263	303	392
Government	221	350	489	572	766
Non-Farm Proprietors	67	126	175	202	260
Total	719	1,226	1,680	1,929	2,490

TABLE R3A-23

UINTAH COUNTY
High Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	3,223	9,333	10,016	10,590	10,590
Contract Construction	7,732	569	1,783	520	695
Manufacturing	31	55	68	75	85
Transp., Comm., & Utilities	96	178	231	261	316
Wholesale & Retail Trade	548	1,032	1,337	1,513	1,829
Finance, Insurance & Real Estate	69	136	180	207	258
Services	383	723	940	1,065	1,295
Government	642	1,175	1,618	1,923	2,531
Non-Farm Proprietors	183	384	531	622	793
Total	12,910	13,585	16,706	16,773	18,393

TABLE R3A-24

COLORADO (Rio Blanco, Moffat Counties)
High Level Development Scenario
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	0	0	0	0	0
Contract Construction	10	16	24	29	39
Manufacturing	0	0	0	0	0
Transp., Comm., & Utilities	5	8	11	12	15
Wholesale & Retail Trade	37	48	64	73	88
Finance, Insurance & Real Estate	5	7	10	11	14
Services	21	31	44	51	65
Government	43	55	79	94	123
Non-Farm Proprietors	14	21	30	35	44
Total	136	189	263	307	389

The CCD-Level Projections

The same three sets of crucial assumptions discussed in the Low Development Scenario--(1) basic employment location, (2) commuting patterns, and (3) trade patterns--will control the allocation of the Regional High Development Scenario impacts among the CCD's in the Uintah Basin and Grand County area. The trade patterns assumption incorporated into this analysis is the same as used in the Low Development Scenario case; i.e., current trade patterns will continue to hold if the High Development Scenario comes about.

In the High Scenario, the Thompson CCd in Grand County is included in the projections because of the planned development of the new town at Westwater. The projected impacts to the Thompson CCD will be significant. This area was not included in the Low Scenario projections. (Table R3A-25).

As is the case with the low scenario, the Vernal CCD will get the majority of the impact of the High Scenario, (63 percent of all impacts in the year 1995). This again will reflect the large number of synfuel project workers living in Vernal, as well as Vernal's continuation as the highest order trade center in the Uintah Basin. The permanent impacts of the Roosevelt and Uintah-Ouray CCD's also will be also significant. The Vernal CCD impact will be, however, the largest in both absolute and relative terms.

Community Level Impacts

The allocations for the High Scenario were accomplished in the same manner as those for the Low Scenario. The impact analysis is completed for the same communities as those for the Low Scenario; Vernal, Roosevelt, Ballard, and Myton. Again, the community allocation assumptions were established by consultation with local area planners.

Under the High Scenario, the assumption is made that 45 percent of new growth in the Vernal CCCD would occur in Vernal City boundaries including its planned growth area. Roosevelt City is assumed to absorb 70 percent of the growth within the Roosevelt CCD. Myton is assumed to absorb 3 and 1/2 percent of the Roosevelt CCD's growth, while Ballard is assumed to absorb 50 percent of the growth in the Uintah-Ouray CCD.

The summary of Utah community impacts is shown in Table R3A-26. Vernal City under the high scenario is anticipated to grow to over 27,500 people which is 152 percent over the baseline and 317 percent over the 1980 census population. The other cities have smaller, yet significant increases.

Again, no allocations for Colorado communities were made. Also, the new town at Westwater is not included in this section because it is not an existing community. The projected size of the community is the same as that of the Thompson CCD in Table R3A-22.

The impacts in the Colorado communities are provided in Table R3A-27. Both Rangely and Dinosaur are projected to have significant population increases.

Personal Income Projections

The same approach as described in the low level development analysis is used in producing the high level income impact projections in Table R3A-28 and R3A-29. Average per capita income will peak during the construction phase with a range of $17,000 per year to $19,000 per year. As the operations phase reaches full employment, average per capita income will reach in the range of $13,000 to $14,000 per year. The largest total personal income impact is projected for Uintah County; this impact will be over three times a great as the impact in Duchesne County. (Table R3A-29)

TABLE R3A-25

SUMMARY OF ALLOCATION
of High Level Development Impacts
(Addition to Baseline)
By Census County Division

	UTAH										COLORADO			
	Roosevelt		Uintah-Ouray		Vernal		"Bonanza"[1]		Thompson (Includes New Town)		Rangely[2]		Dinosaur[2]	
Year	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.
1982	249	36	23	1	673	103	308	681	0	0	39	5	30	4
1983	728	107	64	4	1,938	301	1,531	2,546	0	0	101	12	79	10
1984	1,970	295	176	13	5,025	801	2,797	5,442	1,667	1,112	234	30	184	24
1985	4,549	702	405	30	12,445	2,039	4,459	10,841	4,723	3,154	577	76	453	60
1986	5,892	922	524	39	15,722	2,617	3,820	11,774	4,170	2,764	671	91	527	71
1987	5,881	954	520	40	17,488	3,405	1,958	9,886	4,236	2,731	640	90	502	70
1988	6,001	1,006	521	42	21,001	5,084	658	9,693	3,772	2,297	610	88	479	69
1989	6,542	1,108	563	45	21,740	4,582	1,135	9,693	3,999	2,337	751	109	590	85
1990	6,940	1,201	591	48	22,271	4,755	274	8,783	3,928	2,210	709	106	557	83
1991	7,398	1,312	617	51	23,769	5,102	643	8,897	4,332	2,444	755	115	594	91
1992	8,096	1,467	662	57	25,812	5,554	644	9,625	4,549	2,476	828	130	651	102
1993	8,862	1,643	715	63	28,201	6,088	1,094	10,554	4,731	2,504	923	147	725	116
1994	9,154	1,745	726	66	29,612	6,479	243	9,708	4,792	2,516	960	158	754	124
1995	9,678	1,886	751	71	31,387	6,930	205	9,774	4,878	2,533	1,020	172	801	135
1996	10,162	2,020	774	75	32,875	7,330	205	9,774	4,949	2,548	1,065	184	836	144
1997	10,556	2,137	791	78	34,065	7,674	206	9,774	5,001	2,561	1,100	194	864	152
1998	10,910	2,245	805	81	35,126	7,986	207	9,774	5,034	2,571	1,132	203	889	159
1999	11,225	2,343	818	84	36,006	8,272	206	9,774	5,051	2,578	1,160	211	911	165
2000	11,507	2,433	829	87	36,901	8,532	207	9,774	5,061	2,583	1,184	218	931	171

[1] The Bonanza CCD area definition was developed for this study and does not correspond to an official census area for 1980.

[2] Rangely and Dinosaur impacts for the census county division and for the communities are assumed to be the same.

TABLE R3A-26

UTAH COMMUNITY IMPACTS
High Level Development Scenario

(Addition to Baseline)

Year	Vernal City		Roosevelt City		Myton Town		Ballard Town	
	Pop.	Households	Pop.	Households	Pop.	Households	Pop.	Households
1982	303	103	174	58	9	3	12	4
1983	872	281	510	159	25	8	32	10
1984	2,261	756	1,379	460	69	23	88	29
1985	5,600	1,898	3,184	1,098	159	54	203	69
1986	7,075	2,382	4,124	1,375	206	69	262	88
1987	7,87	2,615	4,117	1,372	206	68	260	86
1988	9,450	3,109	4,201	1,382	210	69	261	86
1989	9,783	3,136	4,579	1,468	229	73	282	90
1990	10,022	3,142	4,858	1,523	243	76	296	93
1991	10,696	3,343	5,179	1,618	259	81	309	97
1992	11,615	3,520	5,667	1,717	283	87	331	100
1993	12,690	3,845	6,203	1,874	310	94	358	108
1994	13,325	3,919	6,408	1,907	320	96	363	109
1995	14,124	4,154	6,775	1,993	339	100	376	111
1996	14,794	4,351	7,113	2,092	356	105	387	112
1997	15,329	4,380	7,389	2,129	369	107	396	113
1998	15,807	4,516	7,637	2,182	382	109	430	115
1999	16,230	4,637	7,858	2,245	393	112	409	117
2000	16,605	4,744	8,055	2,301	403	115	415	119

TABLE R3A-27

COLORADO COMMUNITY IMPACTS
High Level Development Scenario
(Addition to Baseline)

	Rangely		Dinosaur	
	Population	Households	Population	Households
1982	39	13	30	10
1983	101	33	79	26
1984	234	78	184	62
1985	577	196	453	154
1986	671	226	527	177
1987	640	213	502	167
1988	610	201	479	158
1989	751	241	590	189
1990	709	222	557	175
1991	755	236	594	186
1992	828	251	651	197
1993	923	280	725	220
1994	960	282	754	222
1995	1,020	300	801	236
1996	1,065	313	836	246
1997	1,100	314	864	247
1998	1,132	323	889	254
1999	1,160	331	911	260
2000	1,184	338	931	266

TABLE RM-28
High Development Scenario
Personal Income Impact

(Average Figures in 1980 dollars; Total Figures in Thousands of 1980 Dollars)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Mining													
Average Monthly Wage	2,120	2,157	2,194	2,232	2,270	2,309	2,349	2,390	2,431	2,473	2,515	2,559	2,603
Number of Employees	1,052	3,226	4,766	6,756	8,011	9,501	10,660	11,095	11,244	11,519	11,568	12,092	12,089
Total Wage Payment	26,764	83,489	125,470	180,926	218,233	263,285	300,495	318,150	327,981	341,795	361,240	371,275	377,582
Construction													
Average Monthly Wage	2,581	2,625	2,670	2,716	2,763	2,881	2,859	2,909	2,959	3,010	3,062	3,114	3,168
Number of Employees	5,192	10,036	8,982	5,774	3,825	2,907	752	670	311	2,034	806	806	1,058
Total Wage Payment	160,778	317,398	287,814	188,208	126,829	98,051	25,802	23,385	46,546	73,460	29,612	30,122	40,222
Manufacturing													
Average Monthly Wage	878	893	909	924	940	956	973	990	1,007	1,024	1,042	1,060	1,078
Number of Employees	27	71	82	90	101	109	114	124	135	148	156	166	200
Total Wage Payment	284	761	894	998	1,139	1,251	1,331	1,473	1,631	1,819	1,950	2,111	2,587
Transp., Communications & Utilities													
Average Monthly Wage	1,847	1,879	1,911	1,944	1,978	2,012	2,047	2,082	2,118	2,154	2,191	2,229	2,268
Number of Employees	65	170	197	216	242	262	271	295	321	351	369	392	471
Total Wage Payment	1,441	3,833	4,518	5,040	5,743	6,325	6,655	7,370	8,157	9,074	9,703	10,486	12,816
Wholesale & Retail Trade													
Average Monthly Wage	830	844	859	874	889	904	919	935	951	968	985	1,002	1,019
Number of Employees	398	1,032	1,194	1,313	1,465	1,588	1,647	1,791	1,964	2,121	2,232	2,368	2,829
Total Wage Payment	3,963	10,454	12,303	13,763	15,621	17,224	18,172	20,102	18,978	24,634	26,370	28,459	34,585
Finance, Insurance & Real Estate													
Average Monthly Wage	909	925	941	957	973	990	1,007	1,025	1,042	1,060	1,079	1,097	1,116
Number of Employees	50	133	154	173	196	218	229	252	275	301	318	339	415
Total Wage Payment	545	1,476	1,738	1,987	2,289	2,590	2,768	3,098	3,440	3,830	4,116	4,463	5,558
Services													
Average Monthly Wage	754	767	780	793	807	821	835	850	864	879	894	910	925
Number of Employees	253	665	774	857	964	1,051	1,096	1,205	1,312	1,438	1,521	1,621	1,974
Total Wage Payment	2,289	6,119	7,245	8,160	9,337	10,335	10,965	12,206	13,607	15,171	16,323	17,697	21,922
Government													
Average Monthly Wage	916	931	947	964	980	997	1,014	1,032	1,050	1,068	1,086	1,105	1,124
Number of Employees	444	1,163	1,363	1,494	1,661	1,769	1,814	1,990	2,205	2,467	2,660	2,893	3,780
Total Wage Payment	4,878	12,997	15,495	17,277	19,539	21,168	22,081	24,641	27,774	31,610	34,670	38,357	50,982
Non-Farm Proprietors (NFP)													
Average Monthly Wage	1,209	1,230	1,251	1,273	1,295	1,317	1,340	1,363	1,386	1,410	1,435	1,459	1,485
Number of Employees	137	361	418	467	528	585	620	689	763	835	904	973	1,222
Total Wage Payment	1,588	5,329	6,277	7,133	8,204	9,246	9,968	11,269	12,694	14,301	15,563	17,040	21,773
Other Labor Income (OLI)													
Average Monthly OLI	104	106	108	110	111	113	115	117	119	121	124	126	128
Total OLI	7,482	16,535	17,510	16,674	16,465	17,405	16,584	17,422	18,748	20,379	20,303	20,678	22,815
Total Wage Payment	9,347	21,012	22,635	21,926	22,024	23,683	22,955	24,531	26,853	29,692	29,687	31,175	34,990
Property Income plus Transfer Payments minus Individual contribution for Social Insurance													
Average Property Income	141	144	146	149	151	154	156	159	162	165	167	170	173
Population	12,333	28,916	31,807	32,201	33,921	36,380	36,193	38,970	42,491	46,490	47,583	50,128	58,557
Total Property Income	20,891	49,825	55,751	57,465	61,524	67,122	67,928	74,401	82,522	91,845	95,625	102,476	121,355
TOTAL PERSONAL INCOME	233,168	512,693	540,140	502,833	490,482	520,300	489,140	520,706	570,183	637,231	624,859	653,661	724,369
AVERAGE PER CAPITA INCOME	18,906	17,730	16,982	15,615	14,460	14,302	13,515	13,362	13,419	13,707	13,132	13,040	12,413

TABLE R3A-29

TOTAL PERSONAL INCOME IMPACT BY COUNTY
High Development Scenario

(1980 Dollars)

		UTAH COUNTIES						COLORADO Area	
	Per	-----Duchesne----		-----Grand------		-----Uintah-----			
Year	Capita Income	Popul-ation	Personal Income*	Popul-ation	Personal Income*	Popul-ation	Personal Income*	Popul-ation	Personal Income*
1984	18,906	1,997	37,755	1,298	24,540	7,998	151,210	418	7,903
1985	17,730	4,602	81,593	4,032	71,487	17,309	306,889	1,030	18,262
1986	16,982	5,950	101,043	3,098	52,610	20,066	340,761	1,198	20,344
1987	15,615	5,932	92,628	3,478	54,309	19,966	311,769	1,142	17,832
1988	14,460	6,049	87,469	2,98	143,105	22,180	320,723	1,089	15,747
1989	14,302	6,598	94,365	3,186	45,566	23,438	335,210	1,341	19,179
1990	13,515	6,996	94,551	3,094	41,815	23,136	312,683	1,266	17,110
1991	13,362	7,461	99,694	3,478	46,473	24,629	329,093	1,349	18,025
1992	13,419	8,171	109,647	3,674	49,301	27,118	363,896	1,479	19,847
1993	13,707	8,952	122,705	3,838	52,607	30,010	411,347	1,648	22,589
1994	13,132	9,245	121,405	3,886	51,031	30,581	401,590	1,704	22,508
1995	13,040	9,779	127,518	3,963	51,678	32,343	421,753	1,821	23,746
2000	12,413	11,651	144,624	4,142	51,415	37,937	470,912	2,115	26,253

* In thousands of dollars

HIGH LEVEL SCENARIO

Housing

Adequate housing provides a basic community stability. Previous analysis (Construction Worker Profile, Mtn. West Research, Inc. 1975) of worker preference defines housing adequacy as a critical factor in determining job satisfaction. In fact, inadequate housing facilities in other rapid growth situations has been cited as a major contributor to expensive, high workforce turnover rates. The impacts of the proposed high level scenario would seriously test the ability of impacted communities to provide adequate and affordable housing. Those areas significantly impacted, that is having a 10 percent growth over baseline, have a limited vacancy rate (0 - 3 percent) in their current housing stock. Limited housing supply and land speculation have already contributed to a increase in housing costs in Vernal City and the surrounding area. Vernal is projected to receive the largest portion of impact under the high level scenario. The required housing stock within Uintah County, under this scenario, would almost double from the baseline demand of 7,706 units in 1985. Vernal's share of this growth would stimulate a 151.96 percent growth over baseline by 1995. Ballard would experience a 54.84 percent increase in demand for housing units within the same period.

Duchesne County would also face significant increases in demand by 1995 with a potential 67.31 percent growth over baseline from the cumulative increases. The majority of impact in Duchesne County will be in Roosevelt City. The high level scenario would create a housing demand which will double the existing housing available. The projected baseline demand by 1995 is for 1,709 units; the high level demand is for 1,993 units. Myton at the same time would need to increase its housing stock by 58.96 percent over the baseline demand from 212 to 337 units, as shown in Table R3B-16.

TABLE R3B-16

HIGH LEVEL SCENARIO
HOUSING

	Uintah County		Duchesne County	
	1985	1995	1985	1995
Forecast of Demand: Households				
Baseline Demand	7,706	8,581	5,323	5,369
High Level Project Impact	4,356	2,557	1,560	2,876
Interrelated Project Impact	493	3,419	123	738
Cumulative Increase	4,849	5,976	1,683	3,614
Total Demand	12,555	14,857	7,006	8,983
Percent Increase	56.53	29.80	29.31	53.57
Cumulative Percent Increase	62.92	69.64	31.62	67.31

	Vernal		Roosevelt					
	1985	1995	1985	1995				
Forecast of Demands: Households								
Baseline Demand	3,087	3,620	1,622	1,709	205	248	201	212
High Level Project Impact	1,898	4,154	1,098	1,993	69	111	54	100
Interrelated Project Impact	192	1,347	83	508	7	25	4	25
Cumulative Increase	2,090	5,501	1,181	2,501	76	136	58	125
Total Demand	5,177	9,121	2,803	4,210	281	384	259	337
Percent Increase	61.48	114.75	67.69	116.62	33.66	44.76	26.87	47.17
Cumulative Percent Inc	67.70	151.96	72.81	146.34	37.07	54.84	28.86	58.96

	Ballard		Myton	
	1985	1995	1985	1995
Forecast of Demands: Households				
Baseline Demand	205	248	201	212
High Level Project Demand	69	111	54	100
Interrelated Project Demand	7	25	4	25
Cumulative Increase	76	136	58	125
Total Demand	281	384	259	337
Percent Increase	33.66	44.76	26.87	47.17
Cumulative Percent Increase	37.07	54.84	28.86	58.96

Education

Student enrollment projections for Uintah, Duchesne and Rangely School Districts for the peak construction and full operations year are shown in Table R3B-18. The project related enrollment will be felt most significantly in the Uintah District under both the high and low level scenarios. To maintain adequate teacher/pupil ratios, 102 new teachers, or a 37.4 percent growth over baseline, would be required in the Uintah District by 1985. Duchesne District would require 37 teachers, or a 19.4 percent increase over baseline in the same time period. Rangely would also need 8 additional teachers.

In addition, the Uintah District would need another 330 classrooms above baseline projections at full operations in 1995. Duchesne would require an additional 100 classrooms or a 43.5 percent growth over baseline. Rangely would require 19 teachers and 19 classrooms by 1995, the year of full operations under the high level scenario.

If the high level scenario occurred it would also stimulate other educational indicators, including capital investments and major programs/curriculum changes, as cited in the low level scenario discussions.

TABLE R3B-18

HIGH LEVEL SCENARIO
EDUCATION

	Students		Teachers		Classrooms	
	1985	1993	1985	1993	1985	1993
Uintah						
Baseline Demand	6,818	9,186	273	367	273	367
High Level Proj. Imp	2,557	9,253	102	330	102	330
Interrelated Proj. Imp	292	3,006	12	120	12	120
Cumulative Increase	2,849	12,259	114	450	114	450
Total Demand	9,667	20,445	387	817	387	817
Percent Increase	37.50	100.72	37.36	89.92	37.36	89.92
Cumulative Percent Inc	41.79	133.45	41.76	122.62	41.76	122.62
Duchesne						
Baseline Demand	4,764	5,747	191	230	191	230
High Level Proj. Imp	916	2,511	37	100	37	100
Interrelated Proj. Imp	73	649	3	26	3	26
Cumulative Impact Dem.	989	3,160	40	126	40	126
Total Demand	5,753	8,907	230	356	230	356
Percent Increase	19.22	43.69	19.37	43.48	19.37	43.48
Cumulative Percent Inc.	20.76	54.99	20.94	54.78	20.94	54.78
Rangely						
Baseline Demand	5,293	6,464	212	259	212	259
High Level Project Imp	205	468	8	19	8	19
Interrelated Proj. Imp	29	512	1	20	1	20
Cumulative Increase	234	980	9	39	9	39
Total Demand	5,527	7,444	221	298	221	298
Percent Increase	3.87	7.24	3.77	7.33	3.77	7.33
Cumulative Percent Inc.	4.42	15.16	4.25	15.06	4.225	15.06

Medical

Under the high level scenario, hospital bed space in Uintah County's Ashley Valley Hospital would need to increase from a baseline demand of 60 in 1995 to 148 beds (see R3B-19). Duchesne County Hospital would require 25 additional beds in the same period. The health care industry, cognizant of the projected impacts on their industry, have participated with the Utah Department of Health in assessing and preparing for synthetic fuel development (The Impacts of Oil Shale Development on the Health Care Delivery System of the Uintah Basin, John Short & Associates, 1981). Although currently an adequate number of hospital beds in Duchesne County exists, poor physical layout and future demand concern have resulted in the passage of a bond to remodel and expand the Duchesne facility. Ashley Valley Hospital administrators, who recently saw the completion of their new facility, likewise have expressed interest in and commitment to managing the impacts of the projected growth under the development scenarios. This commitment can best be demonstrated by their extensive physician recruitment efforts. The addition of two new surgeons to the study area within the last few years has improved the utilization rates at both the Duchesne County and Ashley Valley Hospitals. The Rangely Hospital has a low utilization rate and can absorb a significant amount of growth within its current capacity.

Table R3B-20 delineates the increase in health manpower that would be required. The impacts on nurses and physicians, already substantially lower than the state standard of 1 per 1,800, will be great.

Emergency medical services would also face significant impacts from growth as projected in Table R3B-21. Uintah County is expected to face the largest increase in EMT demand, a projected Uintah County would need an almost 300 percent increase, from 35 to 103 by 1995. Duchesne County at the same time would absorb the projected growth within its existing supply of EMT's, since at full operations in 1995 only 44 EMT's would be required. Existing supply is comprised of all those in the study area who are certified as Emergency Medical Technicians; most are part-time volunteers. The actual number of practicing EMT's cannot accurately be ascertained. Redistribution of supply appears to be required at full operations under either the high or low level scenarios. Similarly, the demand for ambulances would increase from a

baseline demand of 6 in Uintah County at full operations in 1995 to 14 ambulances under the high level scenario. Duchesne County would require a 50 percent increase over the baseline from 4 ambulances to 6 ambulances. In the Rangely/Dinosaur area there would be a total demand for six ambulances.

TABLE R3B-19

HIGH LEVEL SCENARIO
HOSPITAL BEDS

	1985	1995
Uintah County		
Baseline Demand	51	60
High Level Project Impact	25	64
Interrelated Project Impact	3	24
Cumulative Increase	28	88
Total Demand	89	148
Percent Increase	49.02	106.67
Cumulative Percent Increase	54.90	146.67
Duchesne County		
Baseline Demand	35	37
High Level Project Impact	9	20
Interrelated Project Impact	1	5
Cumulative Increase	10	25
Total Demand	45	62
Percent Increase	25.72	54.05
Cumulative Percent Increase	28.57	67.57
Rangely/Dinosaur		
Baseline Demand	49	55
High Level Project Impact	2	4
Interrelated Project Impact	0	4
Cumulative Increase	2	8
Total Demand	51	63
Percent Increase	4.08	7.27
Cumulative Percent Increase	4.08	14.55

TABLE R38-20

HIGH LEVEL SCENARIO
MEDICAL

	Medical Doctors		Nurses		Dentists		Public Health Nurses	
	1985	1995	1985	1995	1985	1995	1985	1995
Uintah and Duchesne								
Baseline Demand	24	27	73	81	22	24	9	10
High Level Proj. Imp	10	23	29	70	9	21	3.5	8
Interrelated Proj. Imp	1	8	3	24	1	7	0.5	3
Cumulative Increase	11	41	32	94	10	28	4	3
Total Demand	35	58	105	175	32	52	13	21
Percent Increase	41.67	85.19	39.73	86.42	40.91	87.50	38.89	72.73
Cumulative Percent Inc.	45.83	151.85	43.84	116.05	45.45	116.67	44.44	110
Rangely/Dinosaur								
Baseline Demand	14	15	41	46	12	14	5	5.5
High Level Proj. Imp	0	1	2	3	1	1	0	0
Interrelated Proj. Imp	0	1	0	3	0	1	0	0.5
Cumulative Increase	0	2	2	6	1	2	0	0.5
Total Demand	14	17	43	52	13	16	5	6
Percent Increase	0	6.67	4.88	6.52	8.33	7.14	0	0
Cumulative Percent Inc.	0	13.33	4.88	13.04	8.33	14.29	0	9.09

TABLE R3B-21

HIGH LEVEL SCENARIO
AMBULANCES, EMT DEMAND

	Ambulances		EMT's	
	1985	1995	1985	1995
Uintah County				
Baseline Demand	5	6	36	42
High Level Project Impact	3	6	2	16
Interrelated Project Impact	0	2	2	16
Cumulative Increase	3	8	4	32
Total Demand	8	14	56	103
Percent Increase	60	100	5.56	38.10
Cumulative Percent Increase	60	133.33	11.11	76.19
Duchesne County				
Baseline Demand	4	4	25	26
High Level Project Impact	1	2	6	14
Interrelated Project Impact	0	0	1	4
Cumulative Increase	1	2	7	18
Total Demand	5	6	32	44
Percent Increase	25	50	24	69.23
Cumulative Percent Increase	25	50		
Rangely/Dinosaur				
Baseline Demand	5	6	34	39
High Level Project Impact	0	0	1	3
Interrelated Project Impact	0	0	0	3
Cumulative Increase	0	0	1	6
Total Demand	5	6	35	46
Percent Increase	0	0	2.94	7.69
Cumulative Percent Increase	0	0	2.94	15.38

Mental Health

All communities within the impact areas in Utah and Colorado presently have significant shortages of mental health services. No inpatient mental health facilities exist within the study area. Those requiring acute care must travel either to the Wasatch Front or Grand Junction, Colorado. The extent to which this already occurs cannot be determined because of inadequate patient origin data. A recent approved but not funded comprehensive Mental Health Facility proposal finds a present need for four acute care mental health beds in Uintah and Duchesne Counties. The constraint within the mental health delivery system is not limited to inpatient facilities. In fact, mental health workers within the study area state: "We are already constrained to providing crisis intervention instead of in-depth complete mental health services."

Tables R3B-22 and R3B-23 highlight the number of additional mental health workers that would be required under the high level scenario. The Uintah/Duchesne county area would require an additional 11 mental health workers and 3 psychologists/psychiatrists at full operations in 1995 as a result of high level demand and interrelated projects. This contrasts with a potential demand for 1 additional mental health worker in Rangely at the same time.

TABLE R3B-22

HIGH LEVEL SCENARIO:
MENTAL HEALTH: PSYCHOLOGIST/PSYCHIATRISTS

	1985	1995
Uintah and Duchesne		
Baseline Demand	2	2
High Level Project Impact	1	2
Interrelated Project Impact	0	1
Cumulative Increase	1	3
Total Demand	3	5
Percent Increase	50	100
Cumulative Percent Increase	50	100
Rangely/Dinosaur		
Baseline Demand	1	1
High Level Project Impact	0	0
Interrelated Project Impact	0	0
Cumulative Increase	0	0
Total Demand	1	1
Percent Increase	1	1
Cumulative Percent Increase	0	0

HIGH LEVEL SCENARIO
MENTAL HEALTH: SOCIAL WORKERS

	1985	1995
Uintah and Duchesne		
Baseline Demand	9	10
High Level Project Impact	4	8
Interrelated Project Impact	0	3
Cumulative Increase	4	11
Total Demand	13	21
Percent Increase	44.44	80
Cumulative Percent Increase	44.44	110.00
Rangely/Dinosaur		
Baseline Demand	.74	.85
High Level Project Impact	.21	.36
Interrelated Project Impact	.3	.40
Cumulative Increase	.24	.76
Total Demand	.98	1.61
Percent Increase	.28	.42
Cumulative Percent Increase	.32	.89

Law Enforcement

The increase in population under the high scenario (like that of the low scenario) can be expected to result in increased crime. The actual degree to which increased crime would occur cannot be accurately predicted; however, crime will increase proportionate to the increase in population. Under the high level scenario, Uintah County would require 14 additional officers in 1985 (as shown on Table R3B-24), while Duchesne County would require 3 new officers. This represents a 45 percent increase over baseline growth in Uintah County and a 13 percent increase in Duchesne County.

By 1995, under the high level scenario, the demand for law enforcement officers would grow by 35 in Uintah County and 5 in Duchesne County over baseline. The number of patrol cars to adequately serve Uintah County would need to grow by 4 under the same scenario.

Less predictable than personnel and equipment are the impacts that growth may have on the way law enforcement services are delivered. It can be safely assumed that certain elements of the law enforcement program may be impacted more than others and that new programs may have to be added.

TABLE R3B-24a

HIGH LEVEL SCENARIO:
LAW ENFORCEMENT

	Police Officers	
	1985	1995
Duchesne County		
Baseline Demand	23	24
High Level Project Impact	3	5
Interrelated Project Impact	0	1
Cumulative Increase	3	6
Total Demand	26	30
Percent Increase	13.04	20.83
Cumulative Percent Increase	13.04	25
Uintah County		
Baseline Demand	31	35
High Level Project Impact	14	35
Interrelated Project Impact	2	14
Cumulative Increase	16	49
Total Demand	47	84
Percent Increase	45.16	1
Cumulative Percent Increase	51.61	1.40
Rangely		
Baseline Demand	49	55
High Level Project Impact	2	4
Interrelated Project Impact	0	4
Cumulative Increase	2	8
Total Demand	51	63
Percent Increase	4.08	7.23
Cumulative Percent Increase	4.08	14.55

TABLE R3B-24b

HIGH LEVEL SCENARIO:
LAW ENFORCEMENT

	Patrol Cars	
	1985	1995
Duchesne County		
Baseline Demand	6	6
High Level Project Impact	1	1
Interrelated Project Impact	0	0
Cumulative Increase	1	1
Total Demand	7	7
Percent Increase	16.67	16.67
Cumulative Percent Increase	16.67	16.67
Uintah County		
Baseline Demand	8	9
High Level Project Impact	4	4
Interrelated Project Impact	0	3
Cumulative Increase	4	7
Total Demand	12	16
Percent Increase	50	44.44
Cumulative Percent Increase	50	77.78
Rangely		
Baseline Demand	12	14
High Level Project Impact	0	0
Interrelated Project Impact	0	1
Cumulative Increase	0	1
Total Demand	12	15
Percent Increase	0	7.14
Cumulative Percent Increase	0	7.14

Fire Protection

While the number of fire stations within Duchesne County and the Rangely/Dinosaur areas is generally adequate at the present time, the Ashley Valley area could presently utilize additional facilities in Maeser and Jensen. The high level scenario can be expected to increase pressure for these additional facilities. In addition, Ashley Valley area is currently large enough to justify two full-time fire fighters to supplement the volunteer force. The full-time staff would maintain equipment and do inspections. The need to develop a full-time staff will increase under the high level scenario and the capital costs of developing and maintaining a full time fire fighting staff will become a major new expenditure for some of the impact areas.

The critical factor in determining the adequacy of fire protection, however, is the adequacy of fire-flow, that is water pressure through time. If a community has adequate water facilities it should be able to meet fire-flow demand.

Libraries

Acute shortages of books and facilities for libraries exist throughout the study area. The library in Roosevelt, according to state service guidelines, is adequate to serve only 125 people. The Uintah County library would have to double their current supply of books to meet current demand. Table R3B-25 delineates the proposed high level scenario demand for library books both during construction in 1985 and at full operations in 1995. The high scenario demand would require a 108 percent of increase in books in Uintah County, a 52.3 percent increase in Duchesne County and a 6.6 percent increase in the Rangely/ Dinosaur Area. Table R3B-25 delineates the space that might be necessary to accommodate the projected library expansions.

TABLE R3B-25

HIGH LEVEL SCENARIO:
LIBRARIES: BOOKS

	1985	1995
Uintah County		
Baseline Demand	51,460	59,726
High Level Project Impact	25,700	64,276
Interrelated Project Impact	2,906	23,658
Cumulative Increase	28,606	87,934
Total Demand	80,066	147,660
Percent Increase	49.94	107.62
Cumulative Percent Increase	55.59	147.23
Duchesne County		
Baseline Demand	35,556	37,368
High Level Project Impact	9,204	19,558
Interrelated Project Impact	726	5,108
Cumulative Increase	9,930	24,666
Total Demand	13,485	62,034
Percent Increase	25.89	52.34
Cumulative Percent Increase	27.93	66.01
Rangely/Dinosaur		
Baseline Demand	48,710	55,292
High Level Project Impact	2,060	3,642
Interrelated Project Impact	292	4,032
Cumulative Increase	2,352	7,674
Total Demand	51,062	62,966
Percent Increase	4.23	6.59
Cumulative Percent Increase	4.83	13.88

TABLE R3B-26

HIGH LEVEL SCENARIO:
LIBRARIES: SPACE (sq. ft.)

	1985	1995
Uintah County		
Baseline Demand	12,865	14,932
High Level Project Impact	6,425	16,069
Interrelated Project Impact	726.5	5,915
Cumulative Increase	7,151.5	21,984
Total Demand	20,017	36,915
Percent Increase	49.94	107.62
Cumulative Percent Increase	55.59	152.75
Duchesne County		
Baseline Demand	8,889	9,342
High Level Project Impact	2,301	4,890
Interrelated Project Impact	181.5	1,277
Cumulative Increase	2,482.5	6,167
Total Demand	11,372	15,509
Percent Increase	25.89	52.34
Cumulative Percent Increase	27.93	66.01
Rangely/Dinosaur		
Baseline Demand	12,178	13,823
High Level Project Impact	515	910.5
Interrelated Project Impact	73	1,008
Cumulative Increase	588	1,918.5
Total Demand	12,766	15,742
Percent Increase	4.23	6.59
Cumulative Percent Increase	4.83	13.88

Parks

Several national and state parks serve the proposed impacted areas in Colorado and Utah. Increased utilization will increase the operations and maintenance costs for these facilities. However, increased utilization may decrease user satisfaction, particularly among hunters and fishermen as competition increases and resources dwindle. In other rapid growth areas the increased competition for recreational facilities has contributed to the perception of decreased quality of life within boomtown communities. The press for hard community infrastructure such as sewer and schools often cause the postponing of recreational facility expansion. This can be particularly true of neighborhood parks. Uintah County (as shown on Table R3B-27) under the high level scenario would need to more than double its parks from the projected baseline demand of 179 acres in 1995 to 443 acres. Duchesne County would also expect a 52.4 percent increase in demand over baseline from 112 acres to 186. The Rangely/Dinosaur area would similarly need 189 acres in 1995 under the high level scenario, although only 11 acres would be the result of the projects within the EIS.

TABLE R3B-27

HIGH LEVEL SCENARIO
PARKS (acres)

	1985	1995
Uintah County		
Baseline Demand	154.38	179.16
High Level Project Impact	77.10	192.84
Interrelated Project Impact	8.70	70.98
Cumulative Increase	85.80	263.22
Total Demand	240.18	442.98
Percent Increase	44.94	107.64
Cumulative Percent Increase	55.58	147.25
Duchesne County		
Baseline Demand	106.68	112.08
High Level Project Impact	27.60	58.68
Interrelated Project Impact	2.16	15.30
Cumulative Increase	29.76	73.98
Total Demand	136.44	186.06
Percent Increase	25.87	52.36
Cumulative Percent Increase	27.90	66.01
Rangely/Dinosaur		
Baseline Demand	146.16	165.90
High Level Proejct Impact	52.56	10.92
Interrelated Project Impact	0.90	12.12
Cumulative Increase	53.46	23.04
Total Demand	199.62	188.94
Percent Increase	35.96	6.58
Cumulative Percent Increase	36.58	3.84

Sewer

The communities of Myton, Roosevelt, and Vernal, in Utah, and the Rangely/Dinosaur area in Colorado would see significant growth in demand for sewer services under the high level scenario. At full operations in 1995 (as shown on Table R3B-28) under the high level scenario, Myton would begin to strain its sewer system capacity with a demand of 120,000 waste flow gallons per day. Roosevelt, under the same scenario, would exceed its systems capacity by 20.6 percent with a daiy demand from 1,446,700 waste flow gallons.

Vernal needs to complete its current sewer system expansion to handle a high level scenario demand for sewer services that would reach 1,412,000 waste flow gallons per day over the baseline. By 1995, the Rangely/Dinosaur area would need sewer capacity of 3,148,000 by 1995 to handle the sewer demand from the high level scenario.

TABLE R38-28

HIGH LEVEL SCENARIO:
SEWER

	Myton		Vernal	
	1985	1995	1985	1995
Forecasts of Demands: Waste Flow Gallons (per thousand)				
Baseline Demand	71	77	929	1,137
High Level Demand	16	34	56	1,412
Interrelated Project Imp	1	9	57	466
Cumulative Increase	17	43	617	1,879
Total Demand	88	120	1,546	3,016
Percent Increase	22.55	43.86	60.27	124.23
Cumulative Percent Increase	24.26	55.24	66.35	165.24

	Roosevelt		Rangely/Dinosaur	
	1985	1995	1985	1995
Forecasts of Demands: Waste Flow Gallons (per thousand)				
Baseline Demand	542	593	2,436	2,765
High Level Demand	318	678	103	182
Interrelated Project Imp	24	176	15	202
Cumulative Increase	343	853	118	384
Total Demand	884	1,447	2,553	3,148
Percent Increase	58.79	114.17	4.23	6.59
Cumulative Percent Increase	63.29	143.80	4.83	13.88

Water

The high level scenario would bring growth in demand for water in the communities of Myton, Roosevelt, Ballard, Vernal, and the Rangely/Dinosaur area as shown on Table R3B-29. Myton would see the number of connections grow from a baseline forecast of 212 connections in 1995 to 337 connections under the total demand of baseline, interrelated projects, and high level scenario. Roosevelt's baseline demand for 1,709 connections would grow to 4,210 connections if the high level scenario were to occur. This would represent a 177 percent growth over the projected baseline demand. The current water system in Roosevelt would have to be expanded to absorb the growth projected under the high level scenario. Ballard would have to acquire additional water rights to absorb a high level scenario for demand in 1995, that would require 384 total water connections.

Vernal, which is already exceeding its current water system capacity, would require 5,501 additional water connections by 1995 if the high level and interrelated projects were to occur. If the proposed water system is completed, it could absorb the additional demand the high level scenario would bring. The Rangely/Dinosaur area would need a water system with a capacity to handle 2,565 water connections in 1995.

TABLE R3B-29

HIGH LEVEL SCENARIO:
WATER

	Vernal		Roosevelt		Ballard		Myton		Rangely/Dinosaur	
	1985	1995	1985	1995	1985	1995	1985	1995	1985	1995
Forecasts of Demands: Connections										
Baseline Demand	3,087	3,620	1,622	1,709	205	248	201	212	1,292	1,479
High Level Impact	1,898	4,154	1,098	1,993	69	111	54	100	469	536
Interrelated Project Impact	192	1,347	83	508	7	25	4	25	49	550
Cumulative Increase	2,090	5,501	1,181	2,501	76	136	58	125	698	1,086
Total Demand	5,177	9,121	2,803	4,210	281	384	259	337	1,990	2,565
Percent Increase	61	115	68	117	34	45	27	47	50	36
Cumulative Percent Increase	68	152	73	146	37	55	29	59	54	73
Forecasts of Demands: Water Rights (GPCD)* (in thousands)										
Baseline Demand	2,470	2,896	1,298	1,367	164	798	161	170	1,034	1,183
High Level Impact	1,518	3,323	878	1,594	55	89	43	80	579	429
Interrelated Project Impact	154	1,078	66	406	5	20	3	20	39	440
Cumulative Increase	1,672	4,400	945	2,000	60	109	46	100	558	869
Total Demand	4,142	7,297	2,242	3,368	225	307	207	270	1,592	2,052
Percent Increase	61	115	68	117	34	45	27	47	50	36
Cumulative Percent Increase	68	152	73	146	37	55	29	59	54	73

*GPCD: Gallons Per Connection Per Day

TABLE R3B-30

HIGH LEVEL SCENARIO:
WATER

	Vernal		Roosevelt		Ballard		Myton		Rangely/Dinosaur	
	1985	1995	1985	1995	1985	1995	1985	1995	1985	1995
Forecasts of Demand: Storage (in thousands)										
Baseline Demand	2,470	2,896	1,297	1,367	164	198	161	170	1,034	1,183
High Level Impact	1,518	3,323	878	1,594	55	89	43	80	519	429
Interrelated Proj Imp	153	1,078	66	406	5	20	3	20	39	440
Cumulative Increase	672	4,401	945,	2,001	61	109	46	100	558	869
Total Demand	4,142	7,297	2,242	3,368	225	307	207	270	1,592	205
Percent Increase	61	115	68	117	34	45	27	47	50	36
Cumulative Percent Inc	68	152	73	146	37	55	29	59	54	73
Forecasts of Demand: Source Production (in thousands)										
Baseline Demand	4,939	5,792	259	2,734	328	397	322	339	20,787	2,366
High Level Impact	3,037	6,646	1,756	3,189	110	178	86	160	1,038	858
Interrelated Proj Imp	307	2,155	133	813	11	40	6	40	78	880
Cumulative Increase	3,344	8,802	2,898	4,002	121	218	93	200	1,117	1,738
Total Demand	8,283	14,594	4,485	6,736	450	614	414	539	3,184	4,104
Percent Increase	61	115	68	117	34	45	27	47	50	36
Cumulative Percent Inc	68	152	73	146	37	55	29	59	54	73

TABLE R38-31

HIGH LEVEL SCENARIO
WATER

	Vernal		Roosevelt		Ballard		Myton		Rangely/Dinosaur	
	1985	1995	1985	1995	1985	1995	1985	1995	1985	1995
Forecasts of Demand: Supply (in thousands)										
Baseline Demand	4,939	5,792	259	2,734	328	397	322	339	20,787	2,366
High Level Impact	3,037	6,646	1,756	3,189	110	178	86	160	1,038	858
Interrelated Proj Imp.	307	2,155	133	813	11	40	6	40	78	880
Cumulative Increase	3,344	8,802	2,898	4,002	121	218	93	200	1,117	1,738
Total Demand	8,283	14,594	4,485	6,736	450	614	414	539	3,184	4,104
Percent Increase	61	115	68	117	34	45	27	47	50	36
Cumulative Percent Inc	68	152	73	146	37	55	29	59	54	73

INTERRELATED PROJECTS

The "interrelated projects" is a group of anticipated projects not included in the seven projects examined by the Low or High Scenario. Many of these projects are highly speculative and therefore are not included in the baseline; however, a few are mentioned for their potential cumulative impacts of the area. This set of projects includes four additional synfuel projects, several water development projects and unit two of the Bonanza Power Plant including the necessary coal development. Total oil production of these projects is larger than the planned production under the low scenario. This does indicate the relevance of examining these projects. The organization of this section is similar to the low and high scenario discussions.

Work Force Assumptions

Table R3A-30 summarizes the direct construction and operation phase employment assumptions for each of the eight projects included as interrelated projects. The total construction work force of these projects will peak in the year 1988 with 4,500 people (most of that will be made up of the White River Shale project). Total employment (construction plus operation) will peak at 6,585 in 1991. In 1994 all projects will have completed construction, will be in full operations and will have a stable work force of 4,057. Even though projects will have different peaking years than the low and high scenario, it will not be the impacts of this secenario which are of importance, but rather than cumulative impacts that could be created if these projects were to occur in conjunction with the seven EIS projects. Therefore, the relevant points of analysis will be the same as those of the low and high scenario, years 1985, 1993, and 1995.

As was the case with the seven EIS projects, several projects in the interrelated projects category are anticipating the building of construction camps. These projects will include the White River Shale project and the Bonanza Power Plant. The work camps will minimize the impact on existing communities and will minimize the boom bust cycle prevelant with most large construction projects.

TABLE R3A-30

DIRECT EMPLOYMENT ASSUMPTIONS*
INTERRELATED PROJECTS (NOT INCLUDED IN BASELINE)

PROJECT	BARRELS OF OIL	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
White River Shale	100,000															
Const.-camp		0	90	915	515	175	515	1,195	2,020	1,900	1,470	1,440	810	140	0	0
Const.-noncamp		0	85	915	515	170	515	1,195	2,015	1,895	1,470	1,440	810	140	0	0
Operations		0	0	10	70	370	840	885	990	1,285	1,865	2,215	2,490	3,040	3,355	3,355
C & A Tar Sands	20,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	45	0	125	200	225	0	0	0	0	0	0	0	0	0
Operations		0	0	0	65	145	320	320	320	320	320	320	320	320	320	320
Bonanza Power Plant (Unit 2)	N/A															
Const.-camp		0	0	0	0	0	0	0	100	100	100	100	100	0	0	0
Const.-noncamp		0	0	0	0	0	0	0	280	406	681	592	200	0	0	0
Operations		0	0	0	0	0	0	0	0	20	20	66	80	80	80	80
Deserado Mine (for Unit 2)	N/A															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	0	0	0	0	5	100	38	0	0	0	0	0
Operations		0	0	0	0	0	0	0	9	94	218	240	240	240	240	240
Water Devel. Projects	N/A															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	0	0	10	20	40	50	80	130	170	110	30	3	0	0
Operations		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White River Dam	N/A															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	94	94	36	36	0	0	0	0	0	0	0	0	0	0
Operations		0	0	0	0	5	5	5	5	5	5	5	5	5	5	5
Western Tar Sands	5,000															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	25	0	0	50	50	0	0	0	0	0	0	0	0	0
Operations		0	4	4	4	0	0	7	7	7	7	7	7	7	7	7
Rimex	N/A															
Const.-camp		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Const.-noncamp		0	50	50	0	0	0	0	0	0	0	0	0	0	0	0
Operations		0	0	0	50	50	50	50	50	50	50	50	50	50	50	50
GRAND TOTAL	125,000															
Const.-camp		0	90	915	515	175	515	1,195	2,120	2,000	1,570	1,540	910	140	0	0
Const.-noncamp		0	299	1,059	686	476	830	1,245	2,380	2,531	2,359	2,142	1,040	143	0	0
Operations		0	4	14	189	570	1,215	1,267	1,381	1,781	2,485	2,903	3,192	3,742	4,057	4,057

White River Shale:

This project located south of Bonanza and south of the White River is assumed to produce just over 100,000 barrels of oil and will be developed in three phases, which will make it the largest of all synfuel projects being anticipated in Utah. Full production of phase three (4,035 employees) will occur in 1994. The peak of the construction cycle will be in 1988; however peak employment will occur in 1990 when phase two is in full operation and phase three is under construction. The White River consortium expects their construction contractor to establish on site bachelor camps for approximately 50 percent of the construction work force. The work force data, including work camp numbers, were obtained from Community and Infrastructure Support Study, Gibbs & Hill, August 1981. The estimates for 1982 were adjusted downward as per Bob Gilbert of White River Shale. Mr. Gilbert was helpful in providing information and insight about the project.

C & A Tar Sands:

The C & A Tar Sands project located near the Uintah/Grand County line (near the Enercor/Mono Power P. R. Springs project) will ultimately employ some 320 people when moved into full production. However, before commercial operation is planned, a pilot project is anticipated to be constructed during 1982. C & A Tar Sands at this time has no plans for a construction camp on the site. The best accessibility to this project will be from I-70 to the South and over the Book cliffs. Therefore, the impact of the project will most likely occur in Grand Junction, Colorado unless Enercor builds the new town at Westwater. If this town is constructed, many C & A Tar Sands employees will most likely locate there because of its close proximity to the project. Work force numbers for the project were provided by BLM and verified by project representatives.

Bonanza Power Plant:

The second unit of the Bonanza Power Plant was included as an "other project" because final determination of its construction has not yet been made. The first unit of the power plant (now under construction) is included in the baseline projection. Unit 2 if constructed will begin in 1988 and be will completed in 1992, with peak construction employment in 1990 at 781. After completion, operation personnel is estimated at 80. The project does plan to use its existing work camp at Jensen to house approximately 100 of its employees. Work foce numbers for second unit were obtained from Mountain West Research. Work camp assumptions were provided by Desert G & T.

Deserado Mine:

The Deserado Mine project will include only additional coal development to accomodate expansion of the Bonanza Power Plant Unit 2. Because this mine is located in Rio Blanco County, it is assumed that all the workers will live there, and the Utah impact will be only of an indirect nature because of Vernal's position as a regional trade center. Western Fuels, the operators of the Deserado Mine, have not completed detailed plans of the work force for Unit 2. Work force numbers used were obtained from, Draft Environmental Impact Statement, Moon Lake Power Plant Project, Units 1 & 2. However the timing of those estimates were adjusted to reflect the revised timing of the second unit of the power plant.

Water Development Projects:

This will include the Uintah Basin Water System Improvements and the Flaming Gorge Peaking Power Project both being anticipated for construction by the Bureau of Reclamation. Water projects not included in the Central Utah Project have been included in the baseline projection. The Flaming Gorge project will affect mainly Daggett County, while the Uintah Basin W.S.I. project will have a dispersed impact throughout the Uintah Basin. Construction employment for these projects will peak in 1990 at 170 people. No permanent employment is anticipated for these projects. Work force assumptions for these projects were provided by Thayne Coulter of the U.S. Bureau of Reclamation.

White River Dam:

The White River Dam is anticipated for construction in 1982 and will employ 94 people during the peak of construction. Five people are assumed to be employed during the operations of the project. Work force numbers were taken from the Draft Environmental Impact Statement, White River Dam Project.

Western Tar Sands:

This project anticipates developing 5,000 barrels of oil from tar sands but will have relatively little impact, employing only 50 people during construction (1986) and 7 people during operations. Work force numbers were provided by BLM.

Ramex:

This project located near Bonanza will also have very little impact, employing only 50 people during operation and construction. Work force numbers were provided by BLM.

It should be noted that there are several projects being anticipated near but not in the area of significant socio-economic impact (primarily in Mesa and Rio Blanco Counties, Colorado). These projects include:

Southwest Units I and II, North of Mack, Colorado. This project is a 500 megawatt Coal-Fired Power Plant with a peak construction work force of 1,440 and a peak operations work force of 318.

Loma Mine (Sheridan Enterprises) and Dorchester Mine. These ore mines which will produce 5.4 million tons per year (MTY) and 4 coal mines, respectively, planned to be built northwest of Grand Junction, Colorado. The Loma Mine will employ 525 at peak construction and 550 during operations, while the Dorchester Mine will employ 459 during peak construction and 510 during operations.

Taylor Draw Reservoir. This project planned 6 miles north of Rangely, will employ 50 people during construction.

These projects occur outside the area of socio-economic impact and were not included in the projections for interrelated projects. Moreover, their inclusion would not significantly change the projections for the socio-economic impact area. They could, however, have some small impact on transportation, recreation or other services within the socio-economic output area.

Regional Projections

The same assumptions concerning import substitution and structural change were applied to interrelated projects as were used under the High and Low Scenario. The total magnitude of these projects would warrant the use of this assumption. The total population impact of interrelated projects will peak during the construction phase at approximately 17,000 and will increase again to almost 22,000 by the year 2000. The impact in 1985 will be over 3,000, will rise to almost 15,000 by 1993 and will increase to almost 18,000 by 1995 (Table R3A-31). If these projects occur simultaneously with the seven projects being examined by the EIS, the problems in the surrounding communities will be exacerbated and will make mitigation efforts more difficult. The employment impacts are provided in Table R3A-32. The mining and contract construction sectors contain most of the growth in basic employment.

County Level Projections

The impact of interrelated projects in Duchesne County are relatively small even when compared proportionally with the Low and High Scenarios. Most of the projects included as interrelated are some distance from Roosevelt; thus they will have relatively small impacts in Duchesne County. In 1985 the impact will be 363, only a 2 percent increase over the baseline. The population impacts grow to 11 percent in 1993, 14 percent in 1995, and 18 percent in 2000. (Table R3A-33) The largest employment impacts will be in the sectors of government, trade, and services. (Table R3A-34)

In Uintah County the impacts of interrelated projects are significant but not until the latter part of the 1980's decade. In 1985 the impact will be slightly over 1,600, a 6 percent increase over the baseline (Table R3A-35). By 1993 the impact will be almost 10,000, a 33 percent increase, and 12,000 by 1995, a 40 percent increase. By the year 2000, the impact will reach 14,500, which is a 50 percent increase. Mining employment impacts will represent half of the increase of total employment during operations. (Table R3A-36)

TABLE R3A-31

TOTAL REGIONAL IMPACTS*
Interrelated Projects Scenario
Summary of Impacts
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Basic	Households Impact	Labor Force Impacts	School-Age Population (5-17) Impacts
1982	897	511	393	285	498	161
1983	3,900	2,430	1,988	1,023	2,385	600
1984	2,912	1,757	1,390	825	1,714	484
1985	3,089	1,697	1,221	988	1,657	585
1986	6,311	3,520	2,560	1,930	3,440	1,156
1987	8,826	4,987	3,707	2,517	4,885	1,520
1988	13,816	7,928	5,969	3,905	7,757	2,333
1989	15,312	8,523	6,212	4,480	8,339	2,708
1990	17,003	9,148	6,414	5,121	8,950	3,165
1991	15,061	8,017	5,483	4,252	7,816	2,822
1992	16,069	8,057	5,142	4,732	7,829	3,352
1993	14,905	6,999	4,025	4,420	6,801	3,412
1994	16,357	7,415	4,057	4,795	7,197	3,968
1995	17,740	7,762	4,057	5,125	7,581	4,508
1996	18,739	8,044	4,057	5,354	7,853	4,988
1997	19,619	8,304	4,057	5,555	8,110	5,449
1998	20,409	8,544	4,057	5,738	8,347	5,876
1999	21,121	8,767	4,057	5,907	8,567	6,274
2000	21,681	8,956	4,057	6,046	8,737	6,608

* These represent impacts in all seven counties of the study area including Uintah, Duchesne, Daggett, Grand, Rio Blanco, Moffatt, and Mesa Counties. However, the impacts were significant only in 5 of the 7 counties. For the counties of Daggett and Mesa the impacts were not significant and no further analysis for these counties is included. The county impacts provided in the tables which follow do not sum to the regional total since Daggett and Mesa are not included.

TABLE R3A-32
TOTAL REGIONAL IMPACTS
Interrelated Projects
Employment Impacts By Industry

Industry	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mining (Including Synfuels)	4	15	190	566	1,211	1,263	1,375	1,757	2,461	2,832	3,106	3,655	3,969	3,969	3,966
Contract Construction	396	2,001	1,214	662	1,371	2,484	4,657	4,483	3,983	2,696	2,186	566	328	367	514
Manufacturing	2	8	7	9	17	23	36	42	50	46	53	54	61	66	85
Trans., Commun., & Utilities	5	20	26	41	82	105	165	249	306	282	230	204	215	228	268
Trade	32	120	99	126	254	337	513	599	703	645	733	739	827	904	1,146
Finance, Ins., & Real Estate	4	15	12	16	33	44	68	80	94	88	100	102	115	126	165
Services	20	76	63	81	164	220	337	396	467	434	493	499	562	617	793
Government	37	135	114	152	297	385	584	683	802	720	836	844	957	1,061	1,453
Non-Farm Prop.	11	40	33	44	90	125	193	234	282	275	320	336	382	423	566
TOTAL	511	2,430	1,757	1,697	3,520	4,987	7,928	8,523	9,148	8,017	8,057	6,999	7,415	7,762	8,956

TABLE R3A-33

DUCHESNE COUNTY
Impact of Interrelated Projects
(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Employment Impact Basic	Households Impact	School-Age Population (5-17) Impacts
1982	143	20	0	51	29
1983	643	95	6	221	130
1984	397	66	10	137	80
1985	363	72	20	123	73
1986	793	155	26	264	158
1987	1,290	243	40	430	257
1988	2,094	395	40	700	418
1989	2,320	454	34	781	472
1990	2,546	511	30	849	522
1991	2,764	562	16	892	577
1992	2,336	500	2	730	517
1993	2,092	474	0	628	483
1994	2,321	536	0	683	563
1995	2,554	600	0	738	649
1996	2,726	653	0	779	726
1997	2,883	703	0	824	801
1998	3,025	750	0	840	871
1999	3,155	793	0	876	937
2000	3,259	830	0	905	993

TABLE R3A-34

DUCHESNE COUNTY
Interrelated Projects
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	0	0	0	0	0
Contract Construction	4	35	41	54	79
Manufacturing	2	21	26	34	47
Transp., Comm., & Utilities	12	52	17	21	28
Wholesale & Retail Trade	17	127	117	144	189
Finance, Insurance & Real Estate	2	17	16	20	27
Services	9	75	80	102	141
Government	18	133	122	155	222
Non-Farm Proprietors	6	50	55	69	96
Total	71	511	472	600	830

TABLE R3A-35

UINTAH COUNTY
Impact of Interrelated Projects
(Addition to Baseline)

Year	Population Impact	Population in Communities*	Employment Impact Total	Basic	Households Impact	School-Age Population (5-17) Impacts
1982	580	488	421	348	173	98
1983	3,011	2,086	2,305	1,988	717	421
1984	1,874	1,354	1,405	1,196	467	274
1985	1,631	1,453	1,105	861	493	292
1986	3,675	3,157	2,527	1,990	1,052	630
1987	6,000	4,799	4,175	3,358	1,600	956
1988	9,583	7,452	6,774	5,502	2,492	1,488
1989	10,575	8,566	7,260	5,753	2,884	1,744
1990	11,554	9,979	7,594	5,797	3,360	2,047
1991	12,507	10,957	8,024	5,990	3,535	2,288
1992	10,761	9,845	6,490	4,563	3,077	2,178
1993	9,834	9,691	5,445	3,459	2,910	2,240
1994	10,868	10,867	5,756	3,492	3,196	2,636
1995	11,831	11,829	5,998	3,492	3,419	3,006
1996	12,507	12,506	6,192	3,492	3,573	3,329
1997	13,112	13,111	6,370	3,492	3,746	3,642
1998	13,644	13,643	6,535	3,492	3,790	3,928
1999	14,133	14,132	6,690	3,492	3,926	4,199
2000	14,508	14,507	6,819	3,492	4,030	4,422

*The difference between the population living in communities and total population impact are those people living in the work camps.

TABLE R3A-36

UINTAH COUNTY
Interrelated Projects
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	420	1,923	3,097	3,412	3,412
Contract Construction	447	3,869	474	252	354
Manufacturing	3	25	25	30	38
Transp., Comm., & Utilities	21	234	164	182	212
Wholesale & Retail Trade	63	458	495	614	782
Finance, Insurance & Real Estate	8	60	68	85	111
Services	44	314	332	415	536
Government	75	528	565	720	991
Non-Farm Proprietors	22	182	224	286	385
Total	1,105	7,594	5,444	5,998	6819

In Grand County the impacts will not be large but should be discussed. The only project included as interrelated affecting Grand County is the C & A Tar Sands Project which is most accessible from Grand County. Under the High Scenario (where a new town is planned for construction at Westwater) that many of the workers associated with the project are projected to live in the new town because of its accessibility. Under the Low Scenario (where no new town is assumed) most of the C & A Tar Sands workers are projected to live in Grand Junction, and the impact of Grand County from interrelated projects will be negligible. Therefore, the only relevant interrelated project impacts in Grand County are those associated with the High Scenario. The impacts identified in Appendix L, Tables L-9 and L-10 assumed the High Scenario and a new town. As shown in Table L-9 the population impacts will be 700 in 1985, (a 7 percent increase), and approximately 900 for each year through 1991 to 2000 (a 9-10 percent increase).

In Colorado, interrelated projects will make small, yet potentially significant, impacts from "interrelated projects". The Deserado Mine project which could potentially be expanded to produce coal for the second unit of the Bonanza Power Plant is located in Rio Blanco County. All of the workers associated with the Deserado mine are projected to live in Colorado. The only impact in Utah will be dependent on the degree to which Vernal will be affected by virtue of its place in the central place hierachy as a regional trade center. In Colorado the impacts will be 150 in 1985, 1,700 in 1993, 2,000 in 1995 and 2,400 in the year 2000. These will represent 1, 6, 7, and 9 percent increases over the total baseline projections for the two counties, respectively. (Table R3A-37) The employment sectors most heavily impacted will be mining, government, and trade. (Table R3A-38)

The CCD-Level Projections

The same three sets of crucial assumptions discussed in the Low and High Development Scenarios above--(1) basic employment location, (2) commuting patterns, (Table R3A-39) and (3) trade patterns--will control the allocation of "interrelated projects" impacts. The trade patterns assumption incorporated into this analysis will be the same as that used in the Low and High Devlopment Scenario case; i.e., current trade patterns will continue to hold if the "Interrelated Projects" scenario comes about.

TABLE R3A-37

COLORADO (Rio Blanco-Moffat Counties)
Impacts of Interrelated Projects

(Addition to Baseline)

Year	Population Impact	Employment Impact Total	Employment Impact Basic	Households Impact	School-Age Population (5-17) Impacts
1982	56	7	0	20	11
1983	241	29	0	83	49
1984	148	19	0	51	30
1985	146	20	0	49	29
1986	322	45	0	107	64
1987	501	70	0	167	100
1988	825	130	14	276	165
1989	1,412	399	194	475	287
1990	1,738	523	256	579	356
1991	1,831	532	240	591	382
1992	1,748	532	240	546	387
1993	1,728	539	240	519	399
1994	1,871	570	240	550	454
1995	2,016	603	240	583	512
1996	2,117	630	240	605	564
1997	2,205	654	240	630	613
1998	2,281	676	240	634	657
1999	2,351	697	240	653	698
2000	2,403	714	240	668	732

TABLE R3A-38

COLORADO (Rio Blanco & Moffat Counties)
Interrelated Projects
Employment Impacts by Industry

Industry	1985	1990	1993	1995	2000
Agriculture	0	0	0	0	0
Mining (including Synfuels)	0	218	240	240	240
Contract Construction	2	65	34	43	59
Manufacturing	0	0	0	0	0
Transp., Comm., & Utilities	1	11	12	15	18
Wholesale & Retail Trade	5	67	71	85	106
Finance, Insurance & Real Estate	0	10	11	13	16
Services	3	45	52	63	81
Government	6	75	82	100	135
Non-Farm Proprietors	2	31	37	45	59
Total	20	523	539	603	714

TABLE R3A-39

PROJECT SPECIFIC COMMUTING ASSUMPTION
Interrelated Projects
Percent of Direct Employment Job Holders Residing in CCD

Project	---Vernal--- Construction[1]	Operation	---Roosevelt--- Construction[1]	Operation	---Colorado--- Construction[1]	Operation
Bonanza Power Plant (Unit 2)	.7034	.8050	.2183	.1323	.0783	.0627
Deserado Coal Mine (Unit 2)	.0000	.0000	.0000	.0000	1.000	1.000
Ramex	.7007	.8012	.2206	.1354	.0787	.0634
Western Tar Sands	.7171	.8094	.1806	.0882	.1023	.1024
White River Dam	.6679	.7490	.2438	.1693	.0883	.0817
White River Shale	.6695	.7517	.2423	.1670	.0882	.0813

	---New Town (Westwater)--- Construction	Operation	---Grand Junction--- Construction	Operation
C & A Tar Sands[2]	.7316	.7344	.2684	.2656

[1] This represents the percent of construction workers who do not live in the construction camps. All construction workers living in camps reside in the Bonanza CCD.

[2] A large portion of the workers for the C & A Tar Sands project are assumed to live in the new town at, if it is built, Westwater and in Grand Junction Colorado. See discussion in text.

"Interrelated projects" also include the Thompson CCD in Grand County. Because of the planned development of the new town at Westwater (included in the Thompson CCD), this area will not have significant impact and is therefore included. However, if the new town is not built, "interrelated projects" will not have significant impact in Grand County. As was the case with the Low and High Scenarios, the Vernal CCD gets the majority of the impact of interrelated projects (66 percent of all impacts in the year 1995). This will reflect the large number of White River Shale workers living in Vernal, as well as Vernal's continuation as the highest order trade center in the Uintah Basin. The permanent impacts to the Roosevelt and Uintah-Ouray CCD's will also be significant. The Vernal CCD impact will be, however, the largest in both absolute and relative terms. (Table R3A-40)

Community Level Impacts

The community allocations for the "interrelated projects" were developed in the same manner as for the Low and High Scenarios. (Tables R3A-41 and R3A-42) The impact analysis was completed for the same Utah communities as for the Low Scenario -- Vernal, Roosevelt, Ballard, and Myton. Again the community allocation assumptions were established by consultation with local planners. In Colorado the communities of Rangely and Dinosaur were impacted; this allocation was based on a gravity model which assumed the development in Dinosaur were completed.

Forty percent of new growth attributed to interrelated projects in the Vernal CCD will occur within the Vernal City boundaries including its planned growth area. Roosevelt City is assumed to absorb 70 percent and Myton 3.5 percent of the "interrelated projects" growth within the Roosevelt CCD, while Ballard is assumed to absorb 50 percent of the growth in the Uintah-Ouray CCD. Again no allocations for Colorado communities were made. Also, the new town at Westwater was not included in this section because it is not an existing community. The projected size of the community is the same as that of the Thompson CCD in Table R3A-40.

The summary of community impacts is shown in Table R3A-41 and R3A-42. Vernal City under "interrelated projects" is anticipated to grow by an additional 5,700 people by the year 2000 which is 52 percent over the baseline and a 187 percent increase over the 1980 census population. The other cities will have smaller, yet significant, increases attributable to "interrelated projects".

TABLE R3A-40
SUMMARY OF ALLOCATION
of Interrelated Project Impacts
(Addition to Baseline)
By Census County Division

	UTAH										COLORADO			
	Roosevelt		"Bonanza"[1]		Vernal		Uintah-Ouray		Thompson (Includes New Town)		Rangely[2]		Dinosaur[2]	
Year	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.	Pop.	Employ.
1982	142	20	92	348	475	72	13	1	0	0	31	4	25	3
1983	634	93	925	1,992	2,030	309	56	4	0	0	135	16	106	13
1984	386	61	520	1,192	1,315	208	39	5	369	238	83	11	65	8
1985	348	64	178	852	1,413	245	40	8	691	437	82	11	64	9
1986	760	139	518	1,973	3,072	537	85	17	1,072	692	180	25	142	20
1987	1,243	222	1,201	3,338	4,669	815	130	22	758	429	281	39	220	31
1988	2,017	360	2,131	5,473	7,242	1,265	210	36	791	434	460	65	365	51
1989	2,236	416	2,009	5,675	8,340	1,547	226	38	813	437	758	110	654	95
1990	2,464	474	1,575	5,673	9,740	1,883	239	38	834	440	928	143	810	124
1991	2,635	527	1,543	5,920	10,716	2,067	248	37	854	444	982	157	849	135
1992	2,281	476	915	4,553	9,653	1,912	193	25	875	448	932	156	816	136
1993	2,059	459	143	3,459	9,536	1,969	155	17	893	452	919	159	809	140
1994	2,285	520	0	3,493	10,702	2,246	165	17	906	455	996	176	875	154
1995	2,512	582	0	3,493	11,654	2,486	175	19	915	457	1,073	193	943	170
1996	2,679	633	0	3,493	12,324	2,679	181	20	920	458	1,127	208	990	182
1997	2,831	681	0	3,493	12,912	2,856	187	21	923	459	1,174	220	1,031	194
1998	2,968	726	0	3,493	13,451	3,020	191	22	923	460	1,214	232	1,067	204
1999	3,094	767	0	3,493	13,936	3,174	195	23	921	460	1,252	243	1,099	214
2000	3,194	803	0	3,493	14,308	3,302	198	24	919	460	1,279	252	1,124	222

1 The Bonanza CCD area definition was developed for this study and does not correspond to an official census area for 1980.
2 Rangely and Dinosaur impacts for the census county division and for the communities are assumed to be the same.

TABLE R3A-41

UTAH COMMUNITY IMPACTS
Interrelated Projects

(Addition to Baseline)

Year	Vernal City		Roosevelt City		Myton Town		Ballard Town	
	Pop.	Households	Pop.	Households	Pop.	Households	Pop.	Households
1982	190	67	99	35	5	2	7	2
1983	912	279	444	153	22	8	28	10
1984	526	181	270	93	14	5	20	7
1985	565	192	244	83	12	4	20	7
1986	1,229	410	532	177	27	9	43	14
1987	1,868	623	870	290	44	15	65	22
1988	2,897	1,411	472	71	24	105	35	
1989	3,336	1,123	1,565	527	78	26	113	38
1900	3,896	1,299	1,724	575	86	29	120	40
1991	4,286	1,383	1,845	595	92	30	124	41
1992	2,661	1,206	1,597	499	80	25	97	30
1993	3,814	1,145	1,441	433	72	22	78	23
1994	4,281	1,259	1,600	471	80	24	83	24
1995	4,662	1,347	1,758	508	88	25	88	25
1996	4,930	1,411	1,875	536	94	27	91	26
1997	5,269	1,477	1,981	566	99	28	94	27
1998	5,380	1,494	2,077	577	104	29	96	27
1999	5,574	1,548	2,165	601	108	30	98	27
2000	5,723	1,590	2,236	621	112	31	99	28

TABLE R3A-42

COMMUNITY IMPACTS
Interrelated Projects
(Addition to Baseline)

	Rangely		Dinosaur	
	Population	Households	Population	Households
1982	31	11	25	9
1983	135	47	106	37
1984	83	29	65	22
1985	82	28	64	22
1986	180	60	142	47
1987	281	94	220	73
1988	460	154	365	122
1989	758	255	654	220
1990	928	310	810	270
1991	982	317	849	274
1992	932	295	816	258
1993	919	276	809	243
1994	996	293	875	258
1995	1,073	310	943	273
1996	1,127	322	990	283
1997	1,174	335	1,031	295
1998	1,214	337	1,067	296
1999	1,252	348	1,099	305
2000	1,279	355	1,124	313

Personal Income and Wages

The assumptions for changes in wage structures and the projections of personal income are the same for interrelated projects as those discussed in the low development scenario. The wage-by-sector and total personal income impacts are provided in Table R3A-43. The total personal income impact will peak in 1990. At the county level, the personal impact projections will reflect the per capita income levels generated in Table R3A-43. The greatest total personal income impact would be experienced in Duchesne County (Table R3A-44).

TABLE R34-43

Personal Income Impact Projections
Interrelated Projects

(Average Figures in 1980 dollars; Total Figures in Thousands of 1980 Dollars)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Mining													
Average Monthly Wage	2,120	2,157	2,194	2,232	2,270	2,309	2,349	2,390	2,431	2,473	2,515	2,559	2,603
Number of Employees	190	566	1,211	1,263	1,375	1,757	2,461	2,832	3,106	3,655	3,969	3,969	3,966
Total Wage Payment	4,834	14,648	31,881	33,823	37,457	48,689	69,373	81,208	90,600	108,452	119,800	121,865	123,872
Construction													
Average Monthly Wage	2,581	2,625	2,670	2,716	2,763	2,881	2,859	2,909	2,959	3,010	3,062	3,114	3,168
Number of Employees	1,214	662	1,371	2,484	4,657	4,483	3,983	2,696	2,186	566	328	367	514
Total Wage Payment	37,593	20,853	43,932	80,968	154,416	151,209	136,660	94,097	77,612	20,442	12,050	13,715	19,540
Manufacturing													
Average Monthly Wage	878	893	909	924	940	956	973	990	1,007	1,024	1,042	1,060	1,078
Number of Employees	7	9	17	23	36	42	50	46	53	54	61	66	85
Total Wage Payment	74	96	185	255	406	482	584	546	640	664	763	839	1,099
Transp., Communications & Utilities													
Average Monthly Wage	1,847	1,879	1,911	1,944	1,978	2,012	2,047	2,082	2,118	2,154	2,191	2,229	2,268
Number of Employees	26	41	82	105	165	249	306	282	230	204	215	228	258
Total Wage Payment	576	924	1,881	2,450	3,916	6,011	7,515	7,045	5,845	5,274	5,654	6,099	7,020
Wholesale & Retail Trade													
Average Monthly Wage	830	844	859	874	889	904	919	935	951	968	985	1,002	1,019
Number of Employees	99	126	254	337	513	599	703	645	733	739	827	904	1,146
Total Wage Payment	986	1,276	2,617	3,532	5,470	6,497	7,757	7,239	8,369	8,583	9,770	10,864	14,010
Finance, Insurance & Real Estate													
Average Monthly Wage	909	925	941	957	973	990	1,007	1,025	1,042	1,060	1,079	1,097	1,116
Number of Employees	12	16	33	44	68	80	94	88	100	102	115	126	165
Total Wage Payment	131	178	373	505	794	951	1,136	1,082	1,251	1,298	1,488	1,659	2,210
Services													
Average Monthly Wage	754	767	780	793	807	821	835	850	864	879	894	910	925
Number of Employees	63	81	164	220	337	396	467	434	493	499	562	617	793
Total Wage Payment	570	745	1,535	2,095	3,264	3,902	4,681	4,425	5,113	5,265	6,031	6,736	8,806
Government													
Average Monthly Wage	916	931	947	964	980	997	1,014	1,032	1,050	1,068	1,086	1,105	1,124
Number of Employees	114	152	297	385	584	683	802	720	836	844	957	1,061	1,453
Total Wage Payment	1,252	1,699	3,376	4,452	6,870	8,173	9,762	8,915	10,530	10,814	12,473	14,067	19,597
Non-Farm Proprietors (NFP)													
Average Monthly Wage	1,209	1,230	1,251	1,273	1,295	1,317	1,340	1,363	1,386	1,410	1,435	1,459	1,485
Number of Employees	33	44	90	125	193	234	282	275	320	336	382	423	566
Total Wage Payment	479	649	1,351	1,909	2,999	3,699	4,534	4,498	5,324	5,687	6,576	7,408	10,083
Other Labor Income (OLI)													
Average Monthly OLI	104	106	108	110	111	113	115	117	119	121	124	126	128
Total OLI	2,154	2,101	4,434	6,525	10,347	11,279	12,272	10,901	11,082	9,708	10,424	11,065	12,867
Number of Recipients	1,724	1,653	3,430	4,962	7,735	8,289	8,866	7,742	7,737	6,663	7,033	7,339	8,390
Property Income plus Transfer Payments minus Individual contribution for Social Insurance													
Average Property Income	141	144	146	149	151	154	156	159	162	165	167	170	173
Population	2,912	3,089	6,311	8,826	13,816	15,312	17,003	15,061	16,069	14,905	16,357	17,740	21,681
Total Property Income	4,933	5,323	11,062	15,737	25,059	28,251	31,912	28,754	31,208	29,446	32,872	36,266	45,086
TOTAL PERSONAL INCOME	53,582	48,492	102,627	152,251	250,998	269,143	286,186	248,710	247,574	205,633	217,901	230,583	264,190
AVERAGE PER CAPITA INCOME	18,400	15,698	16,262	17,250	18,167	17,577	16,832	16,514	15,407	13,796	13,322	12,998	12,185

TABLE R3A-44

TOTAL PERSONAL INCOME IMPACT BY COUNTY

Development of Interrelated Projects

(1980 Dollars)

Year	Per Capita Income	UTAH COUNTIES ----Duchesne---- Popul-ation	Personal Income*	----Grand---- Popul-ation	Personal Income*	----Uintah---- Popul-ation	Personal Income*	COLORADO Area Popul-ation	Personal Income*
1984	18,400	397	7,305	369	6,790	1,874	34,482	148	2,723
1985	15,698	636	5,698	691	10,847	1,631	25,603	146	2,292
1986	16,262	793	12,896	1,072	17,433	3,675	59,763	322	5,236
1987	17,250	1,290	22,253	758	13,076	6,000	103,500	501	8,642
1988	18,167	2,094	38,042	791	14,370	9,583	174,094	825	14,988
1989	17,577	2,320	40,779	813	14,290	10,575	185,877	1,412	24,819
1990	16,832	2,546	42,854	834	14,038	11,554	194,477	1,738	29,254
1991	16,514	2,764	45,645	854	14,103	12,507	206,541	1,831	30,237
1992	15,407	2,336	35,991	875	13,481	10,761	165,795	1,748	26,931
1993	13,796	2,092	28,861	893	12,320	9,834	135,670	728	10,043
1994	13,322	2,321	30,920	906	12,070	10,868	144,783	1,871	24,925
1995	12,998	2,554	33,197	915	11,893	11,831	153,779	2,016	26,204
2000	12,185	3,259	39,711	919	11,198	14,508	176,780	2,403	29,281

* In thousands of dollars

CUMULATIVE IMPACTS

To understand the total potential of growth due to energy development in the Uintah Basin area, it is important to examine the cumulative growth which would occur given baseline growth, the impact of the seven EIS projects, and "interrelated projects" in the area. These cumulative population impacts have been summarized in Table R3CA-45. The cumulative impacts in Uintah County under the Low Scenario (baseline + low scenario + interrelated) would grow to over 64,000 people by 2000, over three times the current population (5.9 percent annual growth rate). Under the High Scenario the population in the year 2000 would be over 81,000, almost four times the current population; this will represents a 7.1 percent annual compounded growth rate.

Over the next two decades, in Duchesne County the total population would be 29,000 (Low Scenario) and over 33,000 (High Scenario) representing a 4.3 percent and 5.0 percent annual growth rates respectively, Grand County and the impacted Colorado counties will have cummulative growth rates lower still.

Uintah County will receive the largest of total magnitude of impact, but will grow at a faster rate than the less populated surrounding counties. If these projects do come about and Uintah County does grow at this rate, the county will not only increase its relative economic importance in the region but will increase to the entire state. Uintah County would surpass many counties of the state and would become one of the most populated counties in Utah.

The tremendous potential for impact becomes even move evident when the Vernal City projections are examined. Vernal City's cumulative impacts would increase growth to almost 27,000 by the end of the century (Low Scenario) and over 33,000 under the High Scenario, more than <u>five times</u> its current population by the end of the century. The additional population of some 27,000 people represents a new city the size of Bountiful or Logan, Utah. The potential demands placed on city officials to meet the service demands of such an increase seem almost unsurmountable. The unincorporated portion of the Ashley Valley surrounding Vernal will grow four times its current population by the year 2000. The potential impact for the community of Dinosaur amounts to over 5.5 times its current population. Boom times are common throughout the Rocky Mountains today because of natural resource development. However, the potential economic and demographic impacts of synfuel developments in rather sparsely settled areas of Utah represents an impact larger than anything ever before proposed in the western U.S.

TABLE R3A-45

CUMULATIVE IMPACTS
Total Population Impacts

UINTAH COUNTY

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	20,522	0	0	0	20,522	20,522
1985	25,730	13,100	17,309	1,631	40,461	44,670
1990	29,326	13,087	23,136	11,544	53,957	64,006
1993	29,982	16,043	30,010	9,834	55,859	69,826
1995	29,863	17,735	32,343	11,831	59,429	74,037
2000	29,985	20,581	37,937	14,508	64,074	81,430

DUCHESNE COUNTY

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	12,565	0	0	0	12,565	12,565
1985	17,778	3,768	4,602	363	21,909	22,743
1990	18,632	4,644	6,996	2,546	25,822	28,174
1993	18,712	5,826	8,952	2,092	26,630	29,756
1995	18,684	6,501	9,779	2,554	27,739	31,017
2000	18,292	7,686	11,651	3,259	29,237	33,202

TABLE R3A-45 (cont.)

CUMULATIVE IMPACTS
Total Population Impacts

VERNAL

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	6,600	0	0	0	6,600	6,600
1985	9,291	4,955	5,600	565	14,811	15,456
1990	11,065	6,300	10,022	3,896	21,261	24,983
1993	11,421	7,736	12,960	3,814	22,971	28,195
1995	11,369	8,568	14,124	4,662	24,599	30,155
2000	10,941	9,970	16,605	5,723	26,634	33,269

ROOSEVELT

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	3,842	0	0	0	3,842	3,842
1985	5,416	2,237	3,184	244	7,897	8,844
1990	5,955	2,764	4,858	1,724	10,443	12,537
1993	5,948	3,461	6,203	1,441	10,850	13,592
1995	5,934	3,858	6,775	1,758	11,550	14,467
2000	5,789	4,552	8,055	2,236	12,577	16,080

TABLE R3A-45 (cont.)

CUMULATIVE IMPACTS
Total Population Impacts

MYTON

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	0	0	0	0	0	0
1985	705	112	159	12	829	876
1990	775	138	243	86	999	1,104
1993	775	173	310	72	1,020	1,157
1995	773	193	339	88	1,054	1,200
2000	754	228	403	112	1,094	1,269

BALLARD

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	558	0	0	0	558	558
1985	775	133	203	20	928	998
1990	966	154	296	120	1,240	1,382
1993	985	179	358	78	1,242	1,421
1995	976	191	376	88	1,255	1,440
2000	926	207	415	99	1,232	1,440

UNINCORPORATED ASHLEY VALLEY

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	9,568	0	0	0	9,568	9,568
1985	11,272	4,954	5,855	848	17,074	17,975
1990	12,546	6,299	12,249	5,844	24,689	30,639
1993	12,783	7,736	15,511	5,722	26,241	34,016
1995	12,748	8,567	17,263	6,992	28,307	37,003
2000	12,463	9,969	20,296	8,585	31,017	41,344

TABLE R3A-45 (cont.)

CUMULATIVE IMPACTS
Total Population Impacts

RANGELY

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	2,126	0	0	0	2,126	2,126
1985	3,193	454	577	82	3,729	3,852
1990	3,993	395	709	928	5,316	5,630
1993	3,725	475	923	919	5,119	5,567
1995	3,805	523	1,020	1,073	5,401	5,898
2000	3,962	604	1,184	1,279	5,845	6,425

DINOSAUR

	Baseline	Low Scenario	High Scenario	Interrelated Projects	Baseline + Low + Inter.	Baseline + High + Inter.
1980	312	0	0	0	312	312
1985	501	356	453	64	921	1,018
1990	405	310	557	810	1,525	1,772
1993	420	373	725	809	1,602	1,954
1995	425	411	801	943	1,779	2,169
2000	437	474	931	1,124	2,035	2,492

SECTION R3C

TRANSPORTATION

Traffic projections for the seven major EIS projects indicate that more than 12,000 commuter trips alone will be generated. The impact on the existing and proposed transportation network will be significant. U.S. 40 will carry the major portion of the traffic projected in the area. In addition to the baseline, most of this traffic will be generated by additional commuter trips or by inter-city traffic generated by increased population and households due to development of the synfuel projects.

Low-Level Scenario

In the low scenario, the Level of Service (LOS) analysis indicates that U.S. 40 between Roosevelt and Vernal would require upgrading. (A definition of LOS has been included in the Appendix). S.R. 88 is projected at a LOS D by 1993 and may require some improvements. S.R. 45 would operate at a LOS of A through the study years. The three proposed roads for the area would be operating at a satisfactory level-of-service through 1993. Traffic projections and volume-to-capacity of level-of-service analysis for the low scenario are shown in Table R3C-1. A comparison at the baseline is also given.

This comparison indicates traffic on U.S. 40 will double as a result of the impact of the low development scenario. The volume-to-capacity and level-of-service will all change signficantly. On S.R. 88, the level-of-service will be reduced from A to D by 1993. Little impact is projected for the other existing roads in the study area.

High Level Scenario

In the high scenario, U.S. 40 will reach a "LOS" of "F" by 1985, with the segment immediately east of Roosevelt impacted the most. By 1995, traffic on S.R. 88 will also reach unacceptable levels. Some improvements between Ouray and U.S. 40 would be required. High scenario projections are shown in Table R3C-2.

A comparison of high scenario projections to baseline projections indicates almost a three-fold increase in traffic along U.S. 40. S.R. 88 will be the most severely impacted with traffic volumes increasing from 466 vehicles per day in baseline 1995, to 6,727 vehicles per day in high level 1995. This will reduce the level-of-service on this link from an A to a level-of-service of F. Because of high level development, Colorado route 64 will experience a doubling of traffic by 1995. Little impact on S.R. 45 from the high level development will be seen on S.R. 45.

Interrelated Projects

Projections show a four fold increase in the commuter traffic from the energy projects between 1985 and 1993/1995. The analysis of interrelated projects shows that most of U.S. 40 would exceed an acceptable level of performance. The portion of U.S. 40 between Roosevelt and Vernal and the portion east of Vernal would be impacted the most. All other roads in the low level scenario would be operating at an acceptable level of performance. Traffic forecasts and LOS for interrelated projects are shown in Table R3C-3.

Comparison with baseline traffic projections and level-of-service analysis indicates minor increases in traffic or changes in level-of-service. One exception will be on Interstate 70 which is projected to experience major increases in traffic. This will be caused primarily by the new town development of Westwater. Projections for Colorado State Route 64 show an increase in over 1,600 vehicles per day from the "other" projects. S.R. 45 will continue to operate at a level-of-service A.

Low Level Development Scenario Plus Interrelated Projects

Traffic projections were developed for the low level plus interrelated projects scenario for the years 1985 and 1993. By 1985, segments of U.S. 40 will experience over a two fold increase in traffic. Colorado route 64 is proposed to experience a three fold increase in traffic by 1993. State route 45 will experience only small increases in traffic, while state route 88 would experience the largest increases in traffic. Table R3C-4 indicates the projected traffic volumes for this low level scenario plus interrelated

projects. Based on the projected growth for the Uintah Basin, three new roads have been proposed for this area. The general location for these new facilities is shown on Figure R3C-1.

New road "A" is under construction and will travel southeast from Vernal City to the existing S.R. 45, north of Bonanza. Projected traffic, under this scenario, for this new road is approximately 5,000 vehicles per day by 1993. Another new road, extending south from Ouray, would serve the energy projects of TOSCO, Magic Circle, and Geokinetics. Traffic on this road is expected to exceed 1,500 vehicles per day. An extension of S.R. 45 south from Bonanza is also proposed. Traffic on this new road (New Road "D") would exceed 4,000 vehicles per day by 1993.

TABLE R3C-1

LOW LEVEL DEVELOPMENT SCENARIO
TRAFFIC PROJECTIONS*
(Baseline Included)

BASELINE TRAFFIC PROJECTIONS*

Highway Link	1985	1993	V/C 1985	LOS 1985	V/C 1993	LOS 1993	1985	1993	V/C 1985	LOS 1985	V/C 1993	LOS 1993
U.S. 40												
Co. Line to 264	9,212	11,435	1.00	F	1.24	F	5,440	6,506	.59	C	.71	D
264 to 88	6,728	8,286	.73	D	.90	E	3,706	4,433	.40	B	.48	C
88 to Vernal	7,624	9,397	.82	D	1.02	F	3,955	4,731	.43	C	.51	C
Vernal to Jensen	7,168	9,553	.88	E	1.17	F	5,356	6,484	.66	C	.80	D
Jensen to 45	3,238	4,236	.45	C	.58	C	2,348	2,843	.32	B	.39	B
45 to Utah/Colo	3,051	3,951	.42	C	.54	C	1,975	2,390	.27	B	.33	B
I-70												
SR 163 to Utah/Colo	4,175	6,169	--	A	--	A	4,175	6,169	.11	A	.16	A
SR 88												
U.S. 40 to SR 264	3,773	4,752	.57	C	.72	D	364	444	.06	A	.07	A
SR 264 to Ouray	3,828	4,819	.58	C	.73	D	419	403	.06	A	.08	A
New Road "C"	1,189	1,574	.11	A	.15	A	--	--	--	--	--	--
SR 45												
Northern	540	519	.08	A	.08	A	315	383	.05	A	.06	A
Southern	556	519	.08	A	.08	A	331	403	.05	A	.06	A
New Road "D"	1,070	325	.10	A	.03	A	--	--	--	--	--	--
Colo. 64												
Dinosaur to Rangely	5,706	7,567	.62	C	.82	D	4,077	4,935	.44	C	.54	C
New Road "A"												
Vernal to SR 45	2,516	1,775	.27	B	.19	A	--	--	--	--	--	--

* These numbers represent average annual daily traffic.
V/C indicates Volume to Capacity Ratio.
LOS indicates Level of Service.

TABLE R3C-2

Highway Link	HIGH LEVEL DEVELOPMENT SCENARIO TRAFFIC PROJECTIONS* (Baseline Included) 1985	1995	V/C 1985	LOS 1985	V/C 1995	LOS 1995	BASELINE TRAFFIC PROJECTIONS* 1985	1995	V/C 1985	LOS 1985	V/C 1995	LOS 1995
U.S. 40												
Co. Line to 264	10,048	15,977	1.09	F	1.74	F	5,440	6,517	.59	C	.71	D
264 to 88	7,432	11,767	.81	D	1.28	F	3,706	4,441	.40	B	.48	C
88 to Vernal	8,433	13,485	.91	E	1.47	F	3,955	4,739	.43	C	.52	C
Vernal to Jensen	7,403	12,239	.90	E	1.50	F	5,356	6,542	.66	C	.80	D
Jensen to 45	3,309	5,449	.45	C	.75	D	2,348	2,868	.32	B	.40	B
45 to Utah/Colo I-70	3,267	5,282	.45	C	.73	D	1,975	2,412	.27	B	.33	B
SR 163 to Utah/Colo	4,175	6,801	--	A	--	A	4,175	6,801	.11	A	.17	A
SR 88												
U.S. 40 to SR 264	4,241	6,727	.64	C	1.02	F	364	466	.06	A	.07	A
SR 264 to Ouray	4,296	6,798	.65	C	1.03	F	419	537	.06	A	.08	A
New Road "C"	1,254	2,391	.12	A	.23	B	--	--	--	--	--	--
SR 45												
Northern	622	780	.09	A	.12	A	315	403	.05	A	.06	A
Southern	638	801	.10	A	.12	A	331	424	.05	A	.06	A
New Road "D"	1,914	1,627	.18	A	.16	A	--	--	--	--	--	--
Colo. 64												
Dinosaur to Rangely New Road "A"	6,032	9,877	.65	C	1.07	F	4,077	4,980	.44	C	.54	C
Vernal to SR 45	3,421	4,688	.37	B	.51	C	--	--	--	--	--	--

* These numbers represent average annual daily traffic.
V/C indicates Volume to Capacity Ratio.
LOS indicates Level of Service.

TABLE R3C-3

INTERRELATED PROJECTS TRAFFIC PROJECTIONS* (Baseline Included)

BASELINE TRAFFIC PROJECTIONS*

Highway Link	1985	1993	1995	V/C 1985	LOS 1985	V/C 1993	LOS 1993	V/C 1995	LOS 1995	1985	1993	1995	V/C 1985	LOS 1985	V/C 1993	LOS 1993	V/C 1995	LOS 1995
U.S. 40																		
Co. Line to 264	6,902	9,474	9,701	.75	D	1.03	F	1.05	F	5,440	6,506	6,517	.59	C	.71	D	.71	D
264 to 88	4,101	6,753	6,907	.44	C	.73	D	.75	D	3,706	4,433	4,441	.40	B	.48	C	.48	C
88 to Vernal	4,429	7,541	7,682	.48	C	.82	D	.83	D	3,955	4,731	4,739	.43	C	.51	C	.52	C
Vernal to Jensen	5,573	8,332	8,459	.68	D	1.02	F	1.037	F	5,356	6,484	6,542	.66	C	.80	D	.80	D
Jensen to 45	2,450	3,682	3,736	.33	B	.51	C	.52	C	2,348	2,843	2,868	.32	B	.39	B	.40	B
45 to Utah/Colo	2,112	3,330	3,378	.29	B	.46	C	.47	C	1,975	2,390	2,412	.27	B	.33	B	.33	B
I-70																		
SR 163 to Utah/Colo	28,875	30,869	31,501	--	C	--	C/D	--	C/D	4,175	6,169	6,801	.11	A	.16	A	.17	A
SR 88																		
U.S. 40 to SR 264	364	444	466	.05	A	.07	A	.07	A	364	444	466	.06	A	.07	A	.07	A
SR 264 to Ouray	419	511	537	.06	A	.08	A	.08	A	419	511	537	.06	A	.08	A	.08	A
New Road "C"	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SR 45																		
Northern	435	708	744	.07	A	.11	A	.11	A	315	383	403	.05	A	.06	A	.06	A
Southern	451	728	765	.07	A	.11	A	.12	A	331	403	424	.05	A	.06	A	.06	A
New Road "D"	639	3,763	3,970	.06	A	.36	B	.38	B	--	--	--	--	--	--	--	--	--
Colo. 64																		
Dinosaur to Rangely	4,284	6,520	6,628	.47	C	.71	D	.72	D	4,077	4,935	4,980	.44	C	.54	C	.54	C
New Road "A"																		
Vernal to SR 45	686	3,607	3,798	.07	A	.39	B	.41	C	--	--	--	--	--	--	--	--	--

* These numbers represent average annual daily traffic.
V/C indicates Volume to Capacity Ratio.
LOS indicates Level of Service.

TABLE R3C-4

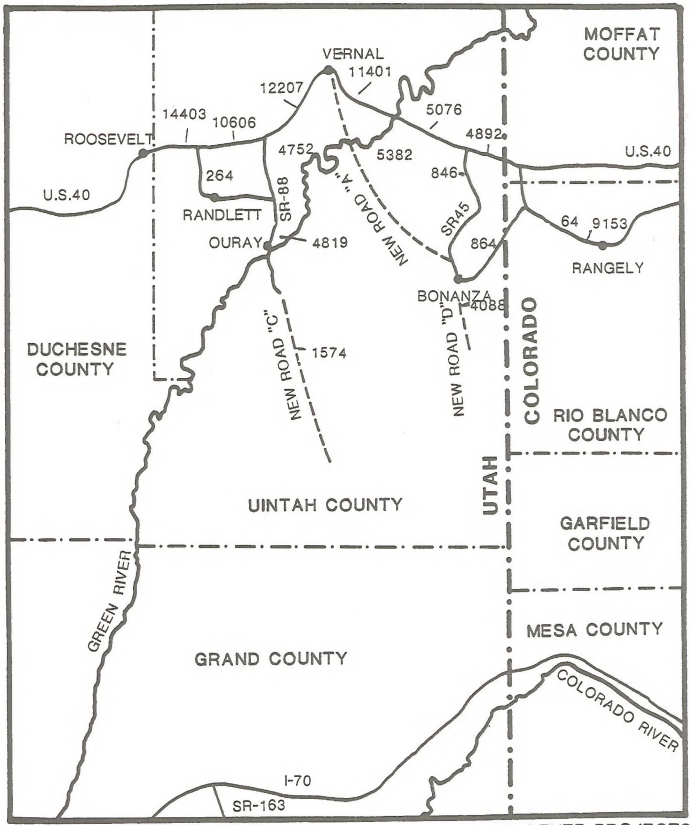
LOW LEVEL DEVELOPMENT SCENARIO
PLUS DEVELOPMENT SCENARIO
(Baseline Included)

BASELINE TRAFFIC PROJECTIONS*

Highway Link	1985	1993	V/C 1985	LOS 1985	V/C 1993	LOS 1993	1985	1993	V/C 1985	LOS 1985	V/C 1993	LOS 1993
U.S. 40												
Co. Line to 264	9,564	14,403	1.04	F	1.57	F	5,440	6,506	.59	C	.71	D
264 to 88	7,125	10,606	.77	D	1.15	F	3,706	4,433	.40	B	.48	C
88 to Vernal	8,106	12,207	.88	E	1.33	F	3,955	4,731	.43	C	.51	C
Vernal to Jensen	7,406	11,401	.90	E	1.40	F	5,356	6,484	.66	C	.80	D
Jensen to 45	3,355	5,076	.46	C	.70	D	2,348	2,843	.32	B	.39	B
45 to Utah/Colo	3,193	4,892	.44	C	.67	D	1,975	2,390	.27	B	.33	B
I-70												
SR 163 to Utah/Colo	28,875	30,869	--	C	00	C/D	4,175	6,169	.11	A	.16	A
SR 88												
U.S. 40 to SR 264	3,773	4,752	.57	C	.72	D	364	444	.06	A	.07	A
SR 264 to Ouray	3,828	4,819	.58	C	.73	D	419	511	.06	A	.08	A
New Road "C"	1,189	1,574	.11	A	.15	A	--	--	--	--	--	--
SR 45												
Northern	660	846	.10	A	.13	A	315	383	.05	A	.06	A
Southern	676	864	.10	A	.13	A	331	403	.05	A	.06	A
New Road "D"	1,709	4,088	.16	A	.39	B	--	--	--	--	--	--
Colo. 64												
Dinosaur to Rangely	5,920	9,153	.64	C	.99	E	4,077	4,935	.44	C	.54	C
New Road "A"												
Vernal to SR 45	3,202	5,382	.34	B	.58	C	--	--	--	--	--	--

* These numbers represent average annual daily traffic.
V/C indicates Volume to Capacity Ratio.
LOS indicates Level of Service.

FIGURE R3C-1



TRAFFIC PROJECTIONS LOW LEVEL SCENARIO PLUS OTHER PROJECTS

Dirt and unimproved local roads are numerous in the area. Although some traffic will be using these facilities, the majority of the traffic generated within this area would probably use the major highways. Without expensive reconstruction, these local roads will not be able to handle significant increases in traffic volumes.

A volume-to-capacity and level-of-service (LOS) analysis shown in Table R3C-4, indicates that U.S. 40 would require significant improvements. By 1985, portions of U.S. 40 would require upgrading to a four lane facility. S.R. 88 would reach a LOS "D" by 1993 and would also require upgrading. The new roads proposed for the area, would be constructed to a two lane rural major collector standard.

Traffic volumes with the low level plus interrelated projects development scenario shows a large increase over the baseline projections. U.S. 40 will experience more than a two-fold increase in traffic over baseline projections. Interstate 70 traffic projections have increased dramatically because of the new town of Westwater. S.R. 88 is projected to have almost a ten-fold increase in traffic from the low level plus other development scenario over the baseline. By 1993, all of the levels of service on the existing roads will have changed except for S.R. 45.

High Level Development Scenario Plus Interrelated Projects

The high level scenario indicates large increases in traffic. U.S. 40, between Roosevelt and Vernal have projected traffic volumes between 14,000 and 19,000 vehicles per day. Colorado 64, west of Rangely, showed a projected traffic volume of 11,500 vehicles per day. The level-of-service analysis (Table R3C-5) indicates that all of U.S. 40 between Roosevelt and the Utah-Colorado border would require upgrading. Colorado 64 would also require upgrading.

S.R. 88 would also be severly impacted. The level-of-service analysis shows that this facility would require upgrading. A "spill over" effect may occur, whereby traffic using these facilities may find alternative routes to travel. This would impact the minor roads in the area.

The three new roads proposed for this area would handle significant amounts of traffic. Traffic on new roads, A, C, and D are projected at 8,486, 2391 & 5597, respectively. By 1995, a two lane facility on new road "A", may not be adequate to handle the proposed traffic volumes.

In the comparison with baseline projections, all of the roads in the study area will experience dramatic increases in traffic because of the high level plus interrelated project developments. All of the roads in the study area, except S.R. 45, will also experience a reduction in level-of-service.

Public Transportation

High level population projections for Vernal indicate that demand is sufficient to warrant some form of intra-city transit system. Since the strains on the existing traffic network will be considerable, an effective public transit system would help to alleviate some of these strains.

Table R3C-6 compares the population of several cities to their respective bus fleets. For cities of approximately 30,000 people, bus fleets range in size from 7 to 40 vehicles A large determinant in the size of the bus fleet will be the political and community support for such a system.

Vernal City could probably justify a bus fleet of 10 to 15 vehicles. The Utah Transit District Act allows communities to establish a bus system provided that a local tax base is established. In the Wasatch Front area, one-fourth of one percent of the sales tax collected is used to help operate the Utah Transit Authority. Additional revenue is generated by the fare box and federal government assistance. The one-fourth of one percent collected is a local option tax approved by the voters in which the UTA operates.

Experience has proven that fare box revenues alone will not generate sufficient revenue to maintain a public transit system. Since the new federal administration has curtailed previous programs to assist mass transit companies. This will increase the burden of the local community in maintaining a transit system increases.

Depending on the amount of service provided, a bus system of 10 to 15 vehicles in Vernal would have the potential of carrying 600,000 to 1,000,000 passengers per year (one-way trips).

TABLE R3C-5

HIGH LEVEL DEVELOPMENT SCENARIO
PLUS INTERRELATED
(Baseline Included)

BASELINE TRAFFIC PROJECTIONS*

Highway Link	1985	1995	V/C 1985	LOS 1985	V/C 1995	LOS 1995	1985	1995	V/C 1985	LOS 1985	V/C 1995	LOS 1995
U.S. 40												
Co. Line to 264	10,421	19,163	1.13	F	2.08	F	5,440	6,517	.59	C	.71	D
264 to 88	7,827	14,235	.85	E	1.55	F	3,706	4,441	.40	B	.48	C
88 to Vernal	8,907	16,430	.97	E	1.79	F	3,955	4,739	.43	C	.52	C
Vernal to Jensen	7,620	14,158	.93	E	1.74	F	5,356	6,542	.66	C	.80	D
Jensen to 45	3,411	6,319	.47	C	.87	E	2,348	2,868	.32	B	.40	B
45 to Utah/Colo	3,404	6,249	.47	C	.86	E	1,975	2,412	.27	B	.33	B
I-70												
SR 163 to Utah/Colo	28,875	3,1501	--	C	--	C/D	4,175	6,801	.11	A	.17	A
SR 88												
U.S. 40 to SR 264	4,241	6,727	.64	C	1.02	F	364	466	.06	A	.07	A
SR 264 to Ouray	4,296	6,798	.65	C	1.03	F	419	537	.06	A	.08	A
New Road "C"	1,254	2,391	.12	A	.23	B	--	--	--	--	--	--
SR 45												
Northern	742	1,121	.11	A	.17	A	315	403	.05	A	.06	A
Southern	758	1,142	.12	A	.17	A	331	424	.05	A	.06	A
New Road "D"	2,553	5,597	.24	B	.54	C	--	--	--	--	--	--
Colo. 64												
Dinosaur to Rangely	6,239	11,526	.68	D	1.25	F	4,077	4,980	.44	C	.54	C
New Road "A"												
Vernal to SR 45	4,107	8,486	.44	C	.92	E	--	--	--	--	--	--

* These numbers represent average annual daily traffic.
V/C indicates Volume to Capacity Ratio.
LOS indicates Level of Service.

R3C-6

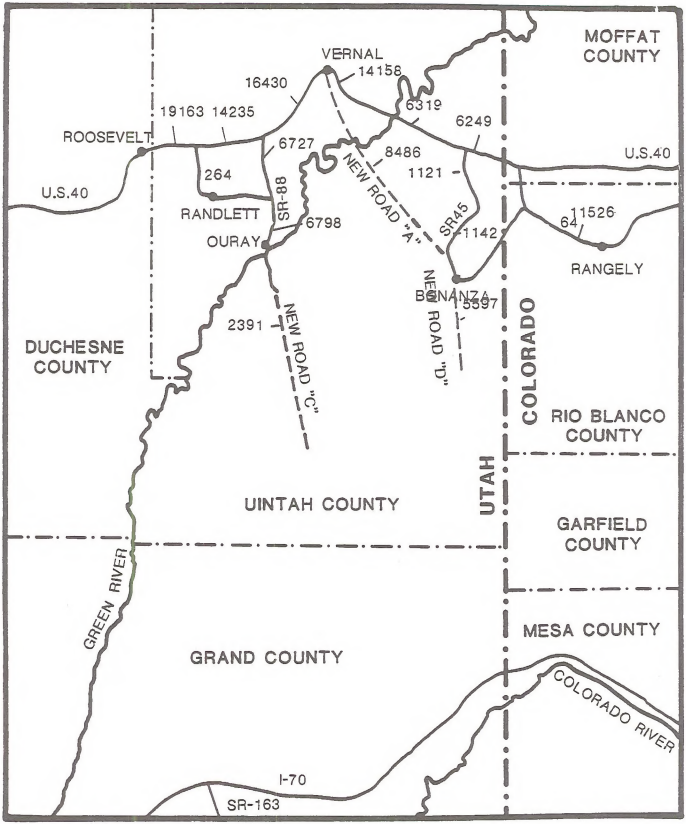
SELECTED TRANSIT PROPERTIES

Population vs. Busses

Transit System	City	Population	# Busses
Arcata & Mad River Transit System	Arcata, California	12,000	5
Santa Rosa Municipal Transit	Santa Rosa, California	98,900	15
Simi Valley Transit	Simi Valley, California	80,000	5
Westport Transit District	Westport, Connecticut	30,000	14
Brevard Transportation Authority	Melbourne, Florida	75,000	15
Taltrans	Tallahassee, Florida	90,000	40
Elgin Public Transportation	Elgin, Illinois	62,000	22
Naperville Area Transit System	Naperville, Illinois	40,000	11
Burlington Urban Service	Burlington, Iowa	33,000	14
Iowa City Transit	Iowa City, Iowa	50,000	20
Owensboro Transit System	Owensboro, Kentucky	43,000	6
St. Cloud Metropolitan Transit Comm.	St. Cloud, Minnesota	50,000	20
Meridian Transit System	Meridian, Mississippi	46,000	12
Jefferson City Transit Authority	Jefferson City, Missouri	32,000	8
Poughkeepsie Bus Transportation	Poughkeepsie, New York	34,000	7
Chapel Hill Community Transit	Chapel Hill, North Carolina	35,000	40
Greater Lynchburg Transit	Lynchburg, Virginia	68,000	27
Intercity Transit Commission	Olympia, Washington	50,000	25

Source: American Public Transit Association, 1979 Directory

FIGURE R3C-2



TRAFFIC PROJECTIONS
HIGH LEVEL SCENARIO PLUS OTHER PROJECTS

The degree of involvement of the energy companies could significantly change the commuter traffic projections. The development of a transportation system would alleviate the burden on the highway network, especially for work trips. The location of these energy projects and the condition of the existing road system make this an ideal case for implementing a high occupancy vehicle program. Financing possibilities range from a United States Department of Transportation demonstration grant to a company sponsored project to an individual private non-profit system. The alternatives for mode of operation would include carpools, vanpools, bus pools, or a public transit system. The ownership and method of administration would also vary significantly.

If the synfuel projects operate with round-the-clock shifts, a private for profit van pool or bus pool could be accommodated. In this operation a group of workers would be taken to the job site and another group of workers would return directly to their homes or to some park-and-ride locations. The cost of the ride would be paid for by the user, although the company could help subsidize the workers for their transportation. The greatest advantage in this case would be the burden of responsibility for operations and maintenance placed on the van pool company. If only day shifts were available a private non-profit vanpool would be established. With this system, a van would bring workers to the site and return with the same workers. The greatest advantages to this system are that the driver of the van will get to use the van when not in service and the costs to the user will be very low. Van pools of this type usually generate group cohesiveness and increase company morale.

Vanpools have been recognized as the most energy-efficient mode of transportation. Particularly in this case, where the system will be described as a "many to one" operation, high occupancy vehicles seem to be the most logical mode of transportation. The key to a successful program is the level of involvement of the company. Without company support, these programs could be

only marginally successful. With good company support and even some top level administrative assistance, vanpools and other programs are extremely successful.

A formalized program in this area may negate the need for additional highway improvements. Further research in this area could identify the level of company support, determine the hours of operation for construction workers and operations people, and recommend a particular program. The costs of developing and implementing such a program would be extremely minimal in comparison to the benefits derived.

Air Transportation Impacts

The impacts on local airports as a result of the oil shale development will occur primarily at Vernal and Roosevelt Municipal. Minor impacts on the other airport within the study area will take place. Air travel demand to Salt Lake, Denver, and other major cities will increase. Although there is no commitment at the time, a major carrier would probably serve Vernal City before the year 2000. Commuter operations would also probably be serving Vernal City and Roosevelt municipal airports.

With the increased population proposed for Vernal City and the surrounding area, a propensity for aircraft operations would increase more than four-fold over the baseline 2000 projections. Itinerant operations should increase because of energy company executives and out-of-state workers. Growth in population and the higher income levels associated with energy development jobs would also increase local operations.

Aircraft operations at Roosevelt Municipal would more than double those of the baseline 2000 projections because of the energy project developments.

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